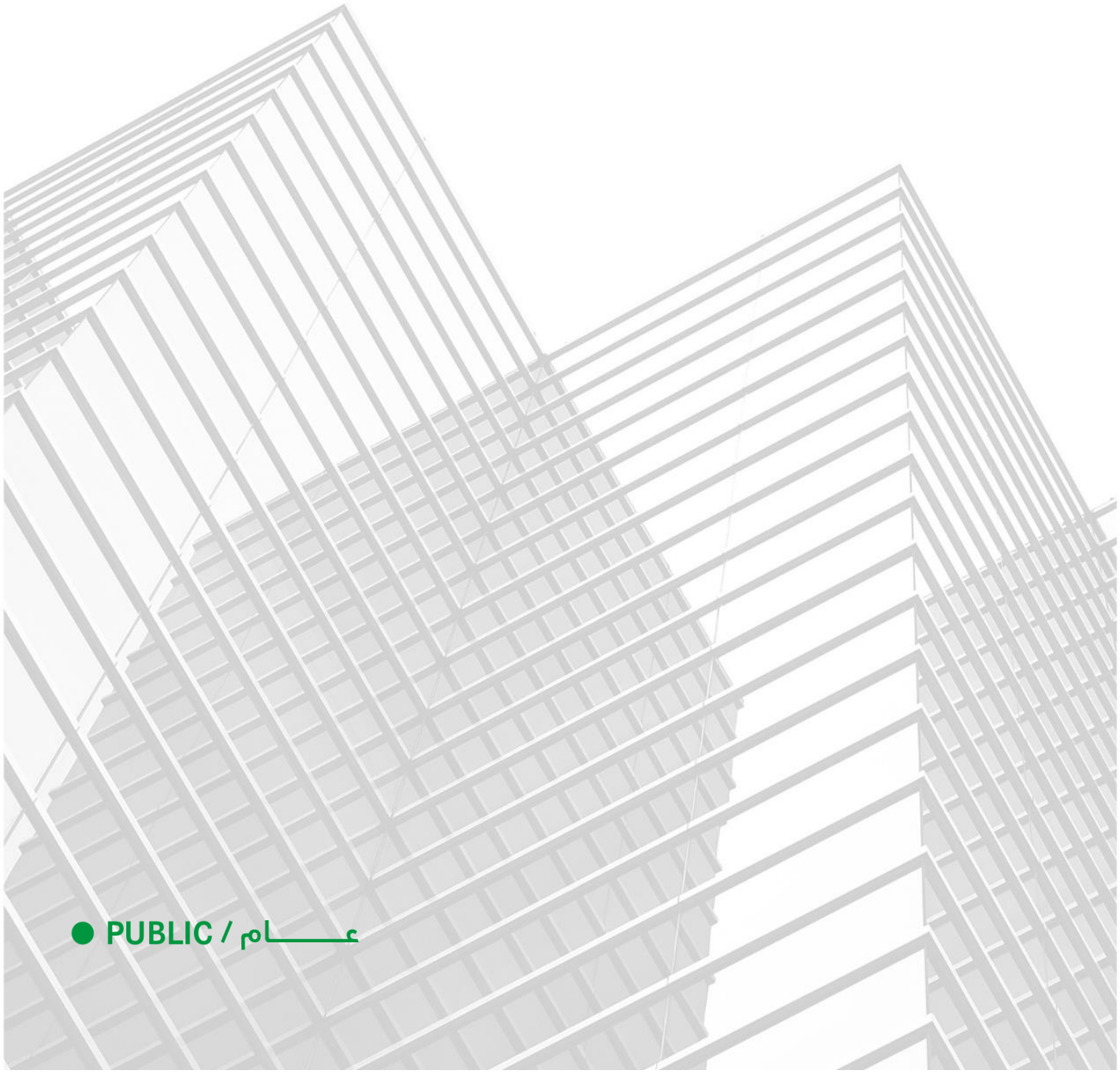
دائـــــرة الـصـــحـــة
DEPARTMENT OF HEALTH

HEALTHY LONGEVITY MEDICINE CLINIC STANDARD



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1.Standard Scope and Purpose

1.1 This Standard sets the minimum requirements for the provision of healthy longevity medicine clinic services in the Emirate of Abu Dhabi.

1.2 This standard applies to all Healthcare facilities licensed by DoH to provide healthy longevity medicine clinic services.

1.3 The aim of the healthy longevity medicine clinic service is to

1.3.1 Promote health, wellness, longevity, and disease prevention.

1.3.2 Enhance healthspan, the period of life spent in good health.

1.3.3 Promote healthier lifestyles

1.3.4 Enable early intervention in age-related diseases

1.3.5 Optimize health span by effectively targeting aging processes across the lifespan, resulting in measurable improvements in health outcomes, functional capacity, and overall quality of life.

2. Definitions and Abbreviations

No.	Term / Abbreviation	Definition
2.1	Aging Biomarkers	Measurable indicators that can assess an individual's biological age and predict age-related outcomes. These biomarkers fall into three main categories: Molecular biomarkers, Physiological biomarkers and Digital biomarkers
2.2	Molecular biomarkers	These include DNA methylation patterns (epigenetic clocks), telomere length, and circulating proteins associated with aging processes.
2.3	Physiological biomarkers	These measure functional decline in various organ systems and include markers such as grip strength, walking speed, lung function, and cognitive performance.
2.4	Digital biomarkers	With the advent of wearable devices and smartphone apps, digital biomarkers are emerging as non-invasive tools for continuous monitoring of health parameters. These include measures of physical activity, sleep patterns, heart rate variability, and gait analysis.

2.5	Biological age	Biological age reflects how well or how poorly a person's body is functioning in comparison to their chronological age, which is the actual number of years they have lived. Biological age is a more accurate predictor of health status and mortality risk than chronological age. Factors influencing biological age include genetics, lifestyle choices, environmental exposures, and the accumulation of molecular and cellular damage over time.
2.6	Body composition	Body composition refers to the distribution of fat, muscle, bone, and other tissues that make up your body. It is often expressed as the percentage of total body weight that consists of fat and/or lean body mass. Body composition offers numerous insights into health, fitness, and nutritional status.
2.7	BIA	Bioelectrical Impedance Analysis (BIA) is a technology to measure human body composition. A technology that quantitatively measures body composition through impedance that occurs when an electric current flows through the human body.
2.8	Clients	People who sign up to longevity medicine clinics. The term "client" implies that a person who wants to use the services of a longevity medicine clinic can be healthy. You do not need to be a patient treated for a particular sickness to benefit from the longevity programs. The term "client" also suggests more autonomy – doctors usually consult diagnostic and intervention offers with their clients and often co-create solutions that are personalized and adjusted to lifestyle.
2.9	CT	Computerized tomography
2.10	DoH	Department of Health
2.11	DEXA	Dual-energy X-ray absorptiometry

2.12	Framingham Risk Score	Framingham score shows the risk of developing heart disease over the next 10 years.
2.13	Geroscience	Geroscience focuses on understanding the genetic, molecular, and cellular mechanisms that make aging a key risk factor for multiple acute and chronic diseases, as well as decreased resilience. It takes a comprehensive approach by targeting the underlying biology of aging, rather than individual diseases, to address multiple conditions simultaneously. The field is highly interdisciplinary, bringing together experts from biology, medicine, genetics, and epidemiology to advance knowledge and interventions.
2.14	HCP	Healthcare Professionals
2.15	Health span	The period of life during which a person is generally healthy and free from serious disease or disability. This encompasses the quality of life, functional independence, and the ability to engage in daily activities without significant health-related limitations. It's more than just living longer—it's about optimizing those additional years to ensure they are healthy, active, and fulfilling.
2.16	HTA	Health Technology Assessment
2.17	HF	Healthcare Facility
2.18	Longevity medicine	Longevity medicine aims to optimize health and health span by targeting aging processes throughout one's lifespan. This innovative approach combines preventive and therapeutic medical practices, encompassing a broad spectrum of diagnostics and interventions. The importance of longevity medicine lies in its potential to revolutionize healthcare by shifting the focus from disease treatment to proactive health diagnostics, optimization, and age-related disease prevention by applying gerodiagnostics and gerointerventions. Longevity medicine differs from general preventive care by its focus on aging biomarkers, geroscience interventions, and

		therapies aimed at extending health span and delaying the onset of age-related diseases
2.19	MRI	Magnetic Resonance Imaging
2.20	QRISK	An algorithm which calculates an individual's 10-year risk of having a heart attack or stroke.
2.21	Severe Cognitive Impairment	Severe cognitive impairment is defined as a condition that substantially limits a person's capacity to understand, process, or follow necessary safety protocols
2.22	SASP	Senescence-associated secretory phenotype
2.23	Test2Prevent	The 'Test2prevent' risk tool calculates the 10-year probability of an individual to develop type 2 diabetes mellitus.

3.Standard Requirements and Specifications

3.1 Eligibility

3.1.1 Individuals aged 18 years and above.

3.1.2 Adults will be included, regardless of existing health conditions, unless they are receiving palliative care or have a severe cognitive impairment that impedes their ability to comply with safety precautions. Severe cognitive impairment is defined as a condition that substantially limits a person's capacity to understand, process, or follow necessary safety protocols

3.1.3 Individuals must not be in situations that compromise their safety or the appropriateness of the services provided. This includes ensuring that their health condition (pregnancy, severe cardiovascular diseases, ongoing oncology treatment, other severe illnesses in the past 3 months or less) or environment does not present risks that cannot be managed safely within the program. Patients with stable chronic conditions still should be getting preventive, restorative and longevity focused strategies as these may better their outcomes in addition to (not replacing) traditional/mainstream management. Acute Conditions: Individuals must not have acute illnesses or injuries requiring immediate medical attention, as these conditions necessitate urgent care beyond the scope of this program.

3.1.4 Patients undergoing major treatment by medical specialists should be included within the agreement of the treating medical specialist.

3.2 Licensure Requirements

3.2.1 All HFs providing healthy longevity medicine clinic services shall adhere to the UAE Laws and Abu Dhabi standards and regulations for providing healthy longevity medicine clinic services in Abu Dhabi.

3.2.2 HF aiming to provide healthy longevity medicine clinic services, shall comply with the DoH licensure requirements.

3.2.3 HF shall be AAMEN certified for ADHICS and fully integrated with the unified electronic medical record system Malaffi.

3.3 Accreditation requirement

3.3.1 All HFs should be accredited by international accreditation within 3 years of the standard publication.

3.4 Staffing requirements

3.4.1 All HCP should hold an active DoH license as per the Professionals Qualification Requirements (PQR) and work within their scope of practice.

3.4.2 The HF must ensure that its healthcare professionals are aligned with the licensed healthcare services and staffing requirements and able to meet the patient load and age group.

3.4.3 All related HCP shall have completed the Information and Cyber Security Awareness courses (assigned by DoH from time to time).

3.4.4 Healthy longevity medicine clinic service should be provided by a multidisciplinary team including, at a minimum, the following:

3.4.4.1 Physicians are required to have finished their specialty training and worked as senior physicians prior to joining the healthy longevity clinic. Physicians must have at least 5 years of experience in a related field or have completed formal training in healthy longevity medicine, lifestyle medicine, and disease prevention. Sufficient expertise and a comprehensive understanding of the underlying biological processes of aging are recommended.

3.4.4.2 Registered Nurses: Registered nurses are responsible for administering treatments, providing patient education, and assisting with medical procedures.

3.4.4.3 Allied health professionals such as:

3.4.4.3.1 Clinical Dietitian - to provide personalized dietary plans promoting optimal nutrition for healthy longevity.

3.4.4.3.2 Physiotherapists and exercise physiologists - to deliver tailored exercise programs to improve mobility, muscle strength, and overall physical well-being.

3.4.4.3.3 Pharmacists - to assess drug-drug and drug supplement interactions. They can also assist with optimization of prescription medication regimes for medications that may be appropriate for a medical diagnosis and demonstrate additional anti-aging benefits.

3.4.4.3.4 Psychologist - to assist with cognitive, mental and emotional assessments and support.

3.4.4.3.5 Health Coach - to assist clients/patients in their journey to encourage, troubleshoot and occasionally offer insight into how clients/patients may plan to achieve their goals.

3.4.4.3.6 Additional team members - each facility may have additional team members to help their clients/patients achieve their goals. These team members may include a genetic counselor to provide comprehensive pre- and post-genetic testing counseling, including risk assessment, education, and guidance on test results and their implications, sports therapist to achieve specific sports goals.

3.4.5 Healthcare professionals should have an advanced life support certificate according to age group according to the privilege requirements of testing offered.

3.4.6 Healthcare professionals should obtain 10 CMEs (Continuing Medical Education) in the field of healthy longevity medicine on an annual basis, which can be obtained either virtually or in person. This is in addition to CME credits for primary license renewal.

3.4.7 Healthcare professionals should align with DoH Standard for Continuing Professional Development (CPD) relating to the Healthcare Workforce, and as published on the DoH website.

3.4.8 Healthcare professionals should adhere to ethical principles and guidelines for all treatments and interventions, ensuring client/patient safety and obtaining an informed consent.

3.4.9 It is recommended that healthcare professionals practicing healthy longevity medicine maintain membership in a reputable professional society related to healthy longevity. This helps promote ongoing learning and networking in the field.

3.4.10 Healthcare professionals should ensure adherence to ethical guidelines for all treatments and interventions, ensuring client/patient safety and informed consent required.

3.5 Facility design:

3.5.1 Facilities should ensure that they meet DoH regulations related to health facility design.

3.5.2 The following equipment should that are DoH approved devices committee (HTA) be available but not limited to: Blood Pressure Monitor, Height and weight measurement equipment, vision and hearing tools, Pulse Oximeter, Ambulatory monitoring devices, Thermometer.

3.5.3 Healthcare facilities should ensure the availability of the following services or establish agreements with outsourced providers:

3.5.3.1 Lab services,

3.5.3.2 Radiological services (Dual-energy X-ray absorptiometry (DEXA), Magnetic Resonance Imaging (MRI), Ultrasound, Computerized tomography (CT)).

3.5.4 Healthcare facilities should ensure that adequate and appropriate levels of supplies and medications are available to serve the population of patients treated; and equipment is routinely maintained and serviced in accordance with the manufacturer's recommendations and retain records to evidence this.

3.6 Clinical care model:

3.6.1 Governance:

3.6.1.1 The healthy longevity medicine clinic is under the supervision of a Facility's medical director who is responsible for overseeing the clinical operations of the clinic and ensuring that all medical staff members are providing high-quality care to clients/patients.

3.6.1.2 The healthy longevity medicine clinic organizational policies and lines of authority and responsibilities should be outlined in writing.

3.6.2 The healthy longevity medicine clinic should ensure developing and implementing the following policy/ procedures and guidelines including but not limited to:

3.6.2.1 The healthy longevity medicine clinic should adopt evidence based standard treatment guidelines/ clinical practice guidelines with evidence of monitoring implementation.

3.6.2.2 Appointment Policies.

3.6.2.3 Assessment policies.

3.6.2.4 Credentialing and privilege.

3.6.2.5 Client/Patient identification policy.

3.6.2.6 Referrals and follow-up.

3.6.2.7 Infection control policies.

3.6.2.8 Medical waste management.

3.6.2.9 Consent Policy as per DoH standards.

3.6.2.10 Client/Patient complaint management.

3.6.2.11 Personnel training and orientation.

3.6.2.12 A preventive maintenance program which ensures that all equipment is maintained safely.

3.6.2.13 Transport of clients/Patient, including method, special equipment, necessary personnel, and protection from inclement weather.

3.6.2.14 Disaster preparedness.

3.6.3 Access:

3.6.3.1 Referrals to a Healthy Longevity Medicine Clinic may be made by primary care physicians, all medical specialists (including but not limited to geriatricians, cardiologists, endocrinologists, and other medical specialists), as well as licensed allied health professionals such as dietitians, physiotherapists, occupational therapists, psychologists etc. This ensures that patients receive comprehensive care and that referrals come from a wide range of healthcare providers who are qualified to assess the patient's health and longevity needs. Patients may also self-refer for such services.

3.6.3.2 Referrals should include the following information: identification, reason for referral, and supporting information (e.g. medical history, medications, allergy, and other relevant information).

3.6.3.3 Individuals seeking to optimize their health, improve fitness, and enhance physical performance and longevity, as per the stated eligibility criteria, may directly access licensed facilities without requiring a referral.

3.6.4 Assessment and plan of care

3.6.4.1 Initial comprehensive health assessments (Appendix 1).

3.6.4.2 Following these assessments, clients/patients are presented with personalized action plans comprising recommendations for lifestyle modifications, potential interventions (Appendix 2), and suggestions for re-testing to gauge the efficacy of the interventions and changes.

3.6.4.3 Tailored intervention plans should be developed through a multidisciplinary team approach, combining expertise from various medical specialties to address individual aging processes and promote health span extension.

3.6.4.4 Enroll clients/patients in longer-term programs involving regular check-ups and consultations with doctors.

3.6.5 Implementation:

3.6.5.1 Implement and support interventions that target specific aging mechanisms, focusing on client/patient education, compliance and sustainable changes to optimize health span.

3.6.5.2 Patients/clients participating in healthy longevity medicine clinic should have interventions developed based on shared decision-making with their clinical team and goals that address both client/patient and clinical team recommendations. Given the diversity of interests and needs, clinics must be prepared to address client/patient needs in multiple domains.

3.6.5.3 Healthy longevity medicine interventions (Appendix 2)

3.6.5.3.1 Lifestyle

3.6.5.3.1.1 Nutrition

3.6.5.3.1.1.1 Dietary interventions will need to be tailored to meet individual needs, informed by dietary assessment and patients'/clients' personal and family health history. These strategies may be focused on risk reduction, such as modifying refined carbohydrate or fatty acid profiles for metabolic and cardiovascular disease, alcohol, and intake of processed products such as meat.

3.6.5.3.1.1.2 In addition, as metabolism and nutritional needs change with time, nutritional interventions must be tailored through the lifespan and according to genetic predisposition. With input from body composition and metabolic assessments, plans must be individualized with specific calorie and nutrient goals to aid in weight and metabolic optimization.

3.6.5.3.1.2 Exercise

3.6.5.3.1.2.1 Assessing muscle mass and function and reviewing current exercise regimens will be important to guide recommendations. Individual health needs and age may influence the relative importance of aerobic vs. resistance training. Assessing all major muscle groups allows refined programs to ensure the appropriate mass and function of these groups.

3.6.5.3.1.3 Sleep

3.6.5.3.1.3.1 Screening for sleep disorders is important to discern clients/patients that may benefit from referral for more detailed sleep assessment vs those that may benefit from educational interventions and strategies to improve sleep quality and quantity.

3.6.5.3.2 Cognitive, Mental and Emotional (Mindfulness, Meditation, Breathing practices, religious practices and prayers as per client/patient preference).

3.6.5.3.3 Social & Environmental (Avoiding Toxins, Education on sustainable lifestyle habits (i.e. social connections, environmental sustainability).

3.6.5.3.4 Medications & Therapeutics (as per appendix 2).

3.6.6 Continuous Monitoring and Evaluation:

3.6.6.1 Healthy longevity medicine clinics may provide repeat testing or continuous monitoring of clients/patients to ensure that treatment plans are effective and appropriate adjustments are made as necessary.

3.6.6.2 Healthy Longevity medicine clinics should utilize licensed, valid and reliable tools and technologies to objectively track progress, evaluate intervention effectiveness, and adjust treatments as needed to ensure continuous optimization of aging processes and health span.

3.6.7 Continuity of care:

3.6.7.1 Physicians should provide a summary to referring physicians and allied healthcare professionals with clear recommendations related to the client/patient.

3.6.7.2 Collaboration and referral options with physicians in other specialties are essential. While longevity assessments aim not to identify disease processes, if a disease is discovered, the healthy longevity medicine clinic should be able to seamlessly refer clients/patients to receive the specialty care needed.

3.6.7.3 Collaborative referrals should include at least the following specialty areas: Neurology, Cardiology, Endocrinology, Gynecologists, Urologists, Psychiatry, Orthopedics, Oncology, Sport Medicine, Immunology, General Practitioners, Family Medicine and Geriatrics.

3.6.8 Clinical record:

3.6.8.1 For each client/patient receiving health care services, the healthy longevity medicine clinic maintains a record that includes identification and social data, evidence of consent forms, pertinent medical and lifestyle history, assessment of the client's health status and health care needs, and a summary of the episode, disposition, and instructions to the client/patient.

3.6.8.2 The healthy longevity medicine clinic maintains a record for each client/patient receiving health care services, which includes the signatures of the physician or other health care professionals.

3.6.8.3 The healthy longevity medicine clinic maintains the confidentiality of recorded information and provides safeguards against loss, destruction, or unauthorized use.

3.6.9 Patient/client Education:

3.6.9.1 Healthy longevity medicine clinic educates patients/client on healthy lifestyle habits, including exercise, diet, and stress management, to help them maintain optimal health and prevent age-related diseases.

3.6.9.2 All Healthcare professionals are responsible for the education of patients.

4.Key stakeholder Roles and Responsibilities

4.1 Health Longevity Medicine Clinic should meet the service specifications and requirements set out in this standard and other relevant DoH regulations.

4.2 Health care professionals must deliver health longevity medicine Clinic services in a licensed healthcare facility that provides the appropriate equipment, support, and other resources necessary for safety and quality of care.

5.Monitoring and Evaluation

5.1 A monitoring and evaluation framework is in place to evaluate the effectiveness, outcomes, and impact of this Standard, and where necessary adopt changes to ensure continuous improvement within the health system in line with emerging new developments in healthcare sciences, medical practices, and healthcare education and training.

6.Enforcement and Sanctions

6.1 DoH may impose sanctions in relation to any breach of requirements under this standard in accordance with the disciplinary regulation of the healthcare sector.

7. Relevant Reference Documents			
No.	**Reference Date**	**Reference Name**	**Relation Explanation / Coding / Publication Links**
1	April 2007	Policy for Infection Control in the HCFs	https://www.doh.gov.ae/en/resources/standards
2	May 2007	Medical Waste Management in Health Care Facilities	https://www.doh.gov.ae/en/resources/standards
3	Jan 2008	Combined impact of health behaviours and mortality in men and women: the EPIC-Norfolk prospective population study	https://pubmed.ncbi.nlm.nih.gov/18184033/
4	February 2008	Patient Rights and Responsibilities	https://www.doh.gov.ae/en/resources/standards
5	March 2010	Long-term exposure to constituents of fine particulate air pollution and mortality: results from the California Teachers Study	https://pubmed.ncbi.nlm.nih.gov/20064787/
6	February 2012	Standard Operating Procedures for Research Ethics Committees Version 1.0	https://www.doh.gov.ae/en/resources/standards
7	February 2012	Exposure to particulate air pollution and cognitive decline in older women	https://pubmed.ncbi.nlm.nih.gov/22332151/
8	July 2014	Osteoporosis screening in postmenopausal women 50 to 64 years old: comparison of US Preventive Services Task Force strategy and two traditional strategies in the Women's Health Initiative	https://pubmed.ncbi.nlm.nih.gov/24431262/

9	Sept 2015	Geroprotectors.org: a new, structured and curated database of current therapeutic interventions in aging and age-related disease	https://pubmed.ncbi.nlm.nih.gov/26342919/
10	Jan 2016	Guidelines for patient consent	https://www.doh.gov.ae/en/resources/guidelines
11	April 2016	The Emergence of Geroscience as an Interdisciplinary Approach to the Enhancement of Health Span and Life Span	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4817738/
12	Nov 2017	HEALTHCARE PROFESSIONALS MANUAL	https://www.doh.gov.ae/en/resources/policies
13	Nov 2017	HEALTHCARE PROVIDERS MANUAL	https://www.doh.gov.ae/en/resources/policies
14	July 2018	Impact of 8 lifestyle factors on mortality and life expectancy among United States veterans: The Million Veteran Program	https://pubmed.ncbi.nlm.nih.gov/38065710/
15	Nov 2018	Artificial intelligence for aging and longevity research: Recent advances& perspectives	https://pubmed.ncbi.nlm.nih.gov/30472217/
17	June 2019	The prevalence and risk factors for diabetes mellitus in healthcare workers at Tygerberg hospital, Cape Town, South Africa: a retrospective study	https://www.tandfonline.com/doi/pdf/10.1080/16089677.2019.1620009
18	2020	NNLM Region 7. What is Geroscience? – Region 7 Update.	https://news.nnlm.gov/region_7/2020/07/28/what-is-geroscience/
19	Jan 2020	Doh Standard On HumanSubject Research	https://www.doh.gov.ae/en/resources/standards

20	February 2020	A clinical guide to hereditary cancer panel testing: evaluation of gene-specific cancer associations and sensitivity of genetic testing criteria in a cohort of 165,000 high-risk patients	https://pubmed.ncbi.nlm.nih.gov/31406321/
21	Jan 2021	Ministerial Resolution No. (14) of 2021 on the Patient's Rights & Responsibilities Charter	https://mohap.gov.ae/assets/d67042d0/Ministerial%20Resolution%20No.%2014%20of%202021.pdf.aspx
22	2021	Top Longevity Clinics In The Uk Landscape Overview	https://analytics.dkv.global/longevity-clinics/2021-Top-Longevity-Clinics-UK.pdf
23	March 2021	Longevity medicine: upskilling the physicians of tomorrow	https://www.thelancet.com/journals/lanhl/article/PIIS2666-7568(21)00024-6/fulltext
24	March 2021	Circular (31 / 2021) Mandatory DoH Approval for New Health Technologies and new Therapeutic Practices	https://www.doh.gov.ae/en/resources/Circulars
25	August 2021	NHS Health Checks: QRISK®3 Explained	https://www.bing.com/search?q=Q-Risk&cvid=3fba391f41514f099ca72298b651bed3&gs_lcrp=EgZjaHJvbWUyBggAEEUYOTIICAEQ6QcY_FXSAQs1M
26	September 2021	Association of Sleep Duration With All- and Major-Cause Mortality Among Adults in Japan, China, Singapore, and Korea	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8417759/
27	November 2021	Psychological and biological resilience modulates the effects of stress on epigenetic aging	https://pubmed.ncbi.nlm.nih.gov/34839356/
28	January 2022	Geroscience	https://link.springer.com/referenceworkentry/10.1007/978-3-030-22009-9_1074
29	2022	World Health Organization. Ageing and health.	https://www.who.int/data/gho/data/themes/mortality-and-global-health- estimates

30	2022	Unified healthcare professional qualification requirement	https://www.doh.gov.ae/en/pqr
31	April 2022	Social Connection as a Public Health Issue: The Evidence and a Systemic Framework for Prioritizing the "Social"	https://pubmed.ncbi.nlm.nih.gov/35021021/
32	June 2022	Effect of a multi-domain lifestyle intervention on cardiovascular risk in older people: the FINGER trial	https://pubmed.ncbi.nlm.nih.gov/35051281/
33	July 2022	Exercise standards for testing and training: a scientific statement from the American Heart Association	https://pubmed.ncbi.nlm.nih.gov/23877260/
34	Oct 2022	Cell-Free DNA-Based Multi-Cancer Early Detection Test in an Asymptomatic Screening Population: Design of a Pragmatic, Prospective Randomised Controlled	https://pubmed.ncbi.nlm.nih.gov/36230741/
35	2023	In search of best practices for Longevity Clinics	https://longevity-roundtable.com/wp-content/uploads/2024/05/White-Paper_Roundtable-of-Longevity-Clinics-2023.pdf
36	2023	National Institute on Aging. Geroscience: The intersection of basic aging biology, chronic disease, and health	https://www.nia.nih.gov/research/dab/geroscience-intersection-basic- aging-biology-chronic-disease-and-health
37	Jan 2023	Hallmarks of aging: An expanding universe	https://pubmed.ncbi.nlm.nih.gov/36599349/
38	March 2023	Standard For Clinical Privileging Of Healthcare Workforce And Clinical Services	https://www.doh.gov.ae/en/resources/standards
39	May 2023	Gulf Economic Update: The Health and Economic Burden of Non-Communicable Diseases in the GCC	https://www.worldbank.org/en/country/gcc/publication/gulf-economic-update-the-health-and-economic-burden-of-non-communicable-diseases-in-the-gcc

40	August 2023	Singapore Opens World's First Healthy Longevity Clinic	https://www.lifespan.io/news/singapore-opens-worlds-first-healthy-longevity-clinic/
41	August 2023	Biomarkers of aging for the identification and evaluation of longevity interventions	https://pubmed.ncbi.nlm.nih.gov/37657418/
42	August 2023	The global estimate of premature cardiovascular mortality: a systematic review and meta-analysis of age-standardized mortality	https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-023-16466-1
43	September 2023	Prospective Associations of Different Combinations of Aerobic and Muscle-Strengthening Activity With All-Cause, Cardiovascular, and Cancer Mortality	https://pubmed.ncbi.nlm.nih.gov/37548973/
44	October 2023	Medical Equipment Longevity Secrets That Will Work For You	https://www.medicareexel.net/medical-equipment-longevity-secrets/
45	2024	Longevity and Ageing Populations in the GCC	https://www.pwc.com/m1/en/publications/documents/2024/longevity-and-ageing-populations-in-gcc-countries-.pdf
46	2024	World Health Organization. Global Health Estimates: Life expectancy and leading causes of death and disability	https://www.who.int/data/gho/data/themes/mortality-and-global-health- estimates
47	Jan 2024	The Longevity Health Plan	https://longevityhealthplan.com/wp-content/uploads/2023/03/2024_LHP_Provider-
48	Jan 2024	Sleep regularity is a stronger predictor of mortality risk than sleep duration: A prospective cohort study	https://pubmed.ncbi.nlm.nih.gov/37738616/
49	February 2024	Sex Differences in Association of Physical Activity With All-Cause and Cardiovascular Mortality	https://pubmed.ncbi.nlm.nih.gov/38383092/

50	March 2024	Establishing healthy longevity clinics in publicly funded hospitals	https://www.researchgate.net/publication/379152303_Establishing_healthy_longevity_clinics_in_publicly_funded_hospitals/fulltext/65fd989dd3a08551423e9c28/Establishing-healthy-longevity-clinics-in-publicly-funded-
51	March 2024	Body Composition: Definition and Insights Into Health	https://www.verywellhealth.com/body-composition-5509458
52	March 2024	The quest to legitimize longevity medicine	https://www.technologyreview.com/2024/03/18/1089888/the-quest-to-legitimize-longevity-medicine/
53	March 2024	Establishing healthy longevity clinics in publicly fundedhospitals	https://link.springer.com/article/10.1007/s11357-024-01132-0
54	May 2024	The longevity clinic of the future is here	https://www.businessinsider.com/what-is-a-longevity-clinic-executive-physical-2024-5
55	May 2024	FDA-cleared home sleep apnea testing devices	https://www.nature.com/articles/s41746-024-01112-w
56	May 2024	Gerogenes and gerosuppression: the pillars of precision geromedicine	https://www.nature.com/articles/s41422-024-00977-6
57	June 2024	Longevity Clinic: What They Are, Services & More	https://spannr.com/articles/longevity-clinics
58	June 2024	Clinical longevity	https://zone.health/clinical-longevity-lp-ads/?utm_source=google&utm_medium=search&utm_campaign=20976201330&utm_adgroup=(_adgroupname%7D&utm_term=longevity%20program&utm_device=m&gad_source=1&gclid=CjwKCAjwps-
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60	June 2024	Longevity Education	https://longevity.degree/
61	June 2024	What are longevity clinics?	https://theweek.com/health-and-science/1024958/what-are-longevity-clinics
62	June 2024	Clinical practice guidelines	https://longevityhealthplan.com/wp-content/uploads/2022/08/Clinical-Practice-Guidelines-
63	June 2024	Healthy Longevity Research Clinic	https://www.ah.com.sg/Pages/Our%20Programmes/HealthyLongevityResearchClinic.aspx
64	June 2024	PREMIUM LONGEVITY CLINIC	https://www.healthylongevityclinic.cz/klinika/boca-raton#process

65	July 2024	Standard for Continuing Professional Development (CPD)	https://www.doh.gov.ae/en/resources/standards
66	August 2024	American Federation for Aging Research.	https://www.afar.org/what-is-geroscience
67	August 2024	Biotech without Borders	https://biotechwithoutborders.org/?gad_source=1&gclid=Cj0KCQjw_sq2BhCUARIsAIVqmQvcxSSAybWX_KwgBz
68	August 2024	Academy for Health & Lifespan Research.	https://www.ahlresearch.org
69	August 2024	Healthy Longevity Medicine Society.	https://hlms.co/
70	August 2024	Biomarkers of Aging Consortium. Establishing Reliable Biomarkers of Aging for Longevity Interventions.	https://www.agingconsortium.org/
71	August 2024	Proteomic aging clock predicts mortality and risk of common age-related diseases in diverse populations	https://www.nature.com/articles/s41591-024-03164-7
72	September 2024	Cardiovascular health and Framingham risk score	https://ukcab.net/resources/factsheets/framingham/
73	2024	Healthcare Workforce Bioethics Guidelines	https://www.doh.gov.ae/en/resources/guidelines
74	September 2024	Technology Registry	https://www.doh.gov.ae/en/research/Technology-Registry

Appendix 1 Healthy Longevity Medicine Diagnostics

Category	Healthy Longevity Medicine Diagnostics Fulfilling eligibility criteria
Mandatory	• Medical history, family history, environmental history • Psychosocial health assessment • Neurological health (Cognitive tests, mood assessment, sleep assessment) • History of screening tests and vaccination history • Medication and supplement use and history • Lifestyle assessment, preferably using objective measures (e.g. validated continuous monitoring device) or validated questionnaires. • Validated risk prediction questionnaires for major age- related diseases, i.e. Q-Risk, Test2Prevent, Framingham Risk Score • Vital signs and physical examination (including major organ systems) • Bioelectrical Impedance Analysis (BIA) • Metabolic function assessment (complete blood count, lipid profile, fasting blood sugar, glycated haemoglobin (HbA1C), insulin) • Renal function tests (electrolytes, blood urea nitrogen, creatinine, glomerular filtration rate) • Liver function tests (liver enzymes, bilirubin, gamma- glutamyl transferase (GGT), prothrombin (PT), albumin) • Hormonal profile (estrogen, thyroid function (thyroid stimulating hormone (TSH), free T4, free T3), cortisol, sex hormones (testosterone, estrogen, progesterone, follicle-stimulating hormone (FSH), luteinizing hormone (LH), dehydroepiandrosterone sulfate (DHEA-S) • Inflammatory Markers (C-Reactive Protein (CRP), erythrocyte sedimentation rate (ESR) • Urinalysis
Optional AND recommended if resources allow	• Cardiovascular pulmonary testing (electrocardiogram, cardiopulmonary exercise testing + VO2 Max) • Advanced cardiovascular imaging (carotid ultrasound, coronary calcium score, angiogram) • Bone mineral density • Guideline based Cancer Screening: Mammogram (for women), prostate-specific antigen (PSA) (for men), colonoscopy, skin cancer testing • Sleep assessment (FDA-approved wearable devices) • Metabolic function assessment (e.g. oral glucose tolerance test (OGTT)) • Hormones: insulin and C-peptide, growth hormone (GH) and insulin growth factor 1

	(IGF-1) • Genetic screening for actionable high-risk genes (BRCA1, 2, Familial Hyperlipidemia, APOE) for patients/clients with known family/personal risk • Stool analysis with gut microbiome testing • Micronutrient analysis • Heavy metal screening • Oral health assessment
Optional AND needs further validation	• Advanced Cardiovascular Biomarkers (Trimethylamine N- oxide (TMAO), Galectin-3, Myeloperoxidase) • Genetic Testing (whole genome, whole exome) for people without known family/personal risk • Other microbiome (oral, skin, vaginal) • DNA methylation • Immune Function: Immunophenotyping • Glycan testing • Advanced biomarker panels (e.g. proteomic and metabolomic profiling) • Cancer markers for early detection • Advanced imaging (whole body MRI)
Not Recommended outside of research protocol	• Non-FDA approved or unvalidated wearable devices for sleep or other physiological assessments • Senescent cells count and senescence-associated secretory phenotype (SASP) markers) • Liquid biopsies • Telomere length • Body scanning technology (e.g. termography)

Appendix 2 Healthy Longevity Medicine Interventions

Healthy Longevity Medicine Interventions*		
Domain	**Intervention**	**Recommendation**
Lifestyle	Nutrition	
	Exercise	
	Sleep	
Cognitive, mental and emotional	Mindfulness, meditation, breathing practices religious practices and prayers as per client preference.	
Social & environmental	Avoiding toxins	
	Education on sustainable lifestyle habits (ie social connections, environmental sustainability)	
Medications & therapeutics	Drugs: Approved use	
	Repurposed drugs: Off-Label Use**	
	Dietary supplements and nutraceuticals (Oral)**	
	IV infusions (i.e. Nicotinamid-Adenin- Dinukleotid (NAD) and precursors/derivatives, vitamins, and other supplements)	
	IV stem cell infusions	
	Gene therapy	
	Exosome treatment	
	Plasmapheresis	
	Hyperbaric oxygen treatment	

Green: Applicable

Orange: Per discretion/ guidelines of clinic policy

Red: Not Currently Applicable / Needs further data

*Interventions listed below are for the purpose of medical treatment of aging and aging-related diseases in Healthy Longevity Medicine Clinics.

**Recommend drugs should have randomized controlled trial (RCT) data in humans with positive results. For drugs with a high level of current safety data, shared decision-making with the provider and client should be applied.