HEALTHY AND MEANINGFUL LONGEVITY COGNITION GRANT CALL APPLICATION GUIDE

Content	PAGE
I. Cognition Grant Call	2
II. General Instructions	7
III. Health Research Classification System	9

I. COGNITION GRANT CALL

(A) Introduction

- The Healthy and Meaningful Longevity (HML) (also known as the National Innovation Challenge on Active and Confident Ageing Phase 2) Funding Initiative seeks to catalyse innovative ideas and research in Singapore that can transform the ageing experience in Singapore. To further enhance and support the Ageing R&D ecosystem, the HML funding initiative will:
  - Drive translation and implementation
  - Focus on the theme of Cognition
  - Future-proof our policies by enhancing our understanding of future seniors and the ageing trajectory

(B) Aim

- The Cognition Grant Call aims to leverage research to address the:
  a) increasing prevalence of cognitive decline and dementia;
  b) high rate of undiagnosed dementia; as well as
  c) high care needs and caregiver burden for people living with Dementia (PLWDs).

(C) Priority Area(s) and/or Challenge Statement(s)

- The challenge statements for the Cognition Grant Call seek to enhance local capabilities in prevention, detection and interventions to prepare for the increase in the number of seniors with cognitive decline.
- Application must address <u>at least one</u> of the priority areas/challenge statements listed in Table 2 below:

<u>Table 2: Priority Areas and Challenge Statements</u>

Priority Areas	Challenge Statements
Preserving cognitive functions	**To improve the understanding of modifiable risk factors of dementia in the local context**, and leverage technology and behavioural science to develop preventive interventions that are easy to implement in home and community settings that **improve awareness, promote lifestyle modifications and improve adherence, to better preserve cognitive function and arrest cognitive decline early among healthy/at-risk seniors** compared to current approaches.
Enhancing early detection and diagnosis	To evaluate new screening and diagnostic tools in the local context, and **adapt these tools suited to Singapore's demographics. The solution should achieve greater efficiency and accuracy of diagnosis, including clear segmentation of at-risk population.** The findings

	should support the development of an optimised case-finding and diagnosis protocol that can be implemented in specific settings (e.g. community and memory clinics).
Managing cognitive impairment	To develop **evidence-based interventions and programmes** to improve support for persons living with dementia (PLWDs) across the spectrum of cognitive impairment that can be deployed and scaled across community/care settings. These multi-modal interventions should **improve the wellbeing of PLWDs** by empowering them to care for themselves as much as possible and **optimising support for their caregivers**.

(D) Eligibility criteria

- A Principal Investigator (PI) can submit only one application in response to the challenge statements. However, he/she may be part of the Project Team of other applications.
- Applicants applying as PI are required to fulfil the following criteria at the point of application:
    - Have PhD or MD/MBBS/BDS qualifications and/or other appropriate postgraduate qualifications (at least a Master's Degree) in areas relevant to the proposed research);
    - Hold a primary appointment in a local publicly funded institution and salaried by the institution;
    - Be an independent PI with demonstrated track record of research, as evidenced by the award of nationally competitive funding (international funding to be considered on a case-by-case basis), substantial publication record in the past 3 years, or PI status in research institutes;
    - Have a laboratory or research program in Singapore;
    - Hold a minimum of 9 months employment (per calendar year) with local Singapore Institution(s). Upon award, the PI must agree to fulfil at least 6 months of residency in Singapore for each calendar year over the duration of the grant award;
    - Must not have outstanding reports from previous BMRC, NMRC grants and other national grants; and
    - For proposals involving patients, the PI should be Singapore Medical Council (SMC) registered; or should be able to demonstrate ability to access patients through SMC registered Co-Is or Collaborators.

(E) Project Team composition for Cognition Grant Call

- Project teams are required to:
    - Collaborate with at least one healthcare cluster and at least one community partner in the development and implementation of their project, with the objective of demonstrating PoC and PoV and collecting data to show evidence of possible further scale-up beyond pilot phase. The partners will need to be identified and included in your proposals.

  - Include at least one technical partner if your cluster and community partner do not have the relevant expertise (e.g. expertise in the technology solution that the team is planning to provide).
- Applicants are expected to form their own partnerships.
- Applicants are to obtain letter of support from Host Institution's senior management for the Full Proposal stage (if applicant is invited to submit a Full Proposal). The letters of support should include the following:
  - HI's commitment to provide necessary support, including eventual deployment if proven to be effective, sustainable and viable
  - HI's verification that project does not duplicate other existing efforts.
- There is no restriction on the number if institutions, investigators and collaborators in each Project Team. However, each healthcare cluster, community partner and technical partner must be represented by at least a team member i.e. Co-Investigator(s) or Collaborator(s).
- Please refer to Table 1 below for the definition and eligibility criteria for each role of project team for the Cognition Grant Call.

Table 1: Project Team Roles, Definition and Eligibility

Role	Definition	Eligibility criteria
Lead PI	An individual who is expected to be actively involved in overall project management and accountable for deliverables. There should only be 1 PI in the team.	He/She must hold a primary appointment in a local publicly funded institution and salaried by the institution.
Co-Investigator	An individual involved in the scientific development and execution of the project. A co-Investigator typically devotes a higher percentage of effort to the project compared to a collaborator and is considered a key research personnel of the project team. There is no limit on the no. of participating co-Is.	He/She should be salaried by a local public/private institution.
Collaborator	An individual involved in the scientific development and execution of project. A collaborator typically devotes only a specific percentage of effort to the project. There is no limit on the no. of participating collaborators.	He/She can be from local/overseas/public/private institutions.

(F) Funding Quantum and Duration

- The Cognition Grant Call will provide a funding quantum of up to S$4M per project[1] (inclusive of up to 30% indirect costs) for up to 3 years.

[1] SG Not-for-profits (e.g. community care providers) will be eligible for 100% funding of direct costs as well as indirect costs (capped at 30% of supported direct costs). Funding to SMEs and non-SMEs will be capped 50% and 30% of qualifying costs respectively, and will not be eligible for indirect costs.

(G) Review Process

- The Cognition Grant Call comprises a 2-stage review process. In the first stage, applicants are required to submit a letter of Intent (LOI). The LOIs will be evaluated by the Cognition Review Panel (RP) that is made up of local and international members with multidisciplinary backgrounds. Shortlisted applicants will be invited to submit full proposals.
- In the second stage, the full proposals will be evaluated by Cognition RP. Applicants will submit a rebuttal to address the issues raised by the RP, and will subsequently be required to attend an interview with the RP. The number of awards given out for the grant call will depend on the quality of the proposals and the amount of funding available.

(H) Evaluation Criteria

- The criteria listed in Table 3 below shall be used for the evaluation of the applications.

Table 3: Evaluation Criteria

Component	Criteria for Shortlisting/ Evaluation
General	• Expertise and Ability of the Lead Principal Investigator and the team to carry out the proposed research project
Scientific Merit	• Address an important problem to yield significant results • Appropriate study design and sound basis for the intervention • Robust methodology and analyses • Advances scientific knowledge, technical capability and the standard of care
Potential impact and outcomes	• Impact in addressing the challenge statement • Cost-effectiveness of the proposed solution compared to existing solutions • Proposed outcomes/ KPIs • Scalability and sustainability of proposed solution
Innovativeness	• Innovative features of the proposed solution, and why they are deemed innovative
Implementation	• Project feasibility and adoption in the local context • Reasonableness of funding request

(I) Post-award Reporting and Review

- Awarded projects will be required to submit a progress report annually, and it will be subjected to a review by a Review Panel (RP) comprising subject matter experts. At the project mid-term mark (e.g., Year 3 for a 5-year project), a Mid-Term Review will be conducted based on the year's progress report by the RP. Project Teams are to demonstrate clear progress for, failing which the RP may recommend a review of the funding quantum or continuity of funding support for the project. Awarded projects will also be required to submit a final report (within 3 months from the end of the funding period) and it will be reviewed by the RP for assessment on achievements and readiness for widespread implementation.

(J) Submission and deadline details

- It is **mandatory** for all applications to be **submitted and endorsed** by Host Institution's Director of Research (DOR) ***online via IGMS*** by **15 August 2024, 5pm**.

- We will not entertain any late submissions or submissions from individual applicants without endorsement from the Host Institution.

II. GENERAL INSTRUCTIONS

- Please prepare your application **using the templates available on the IGMS** online submission system and upload these documents to the relevant sections in IGMS:
  (i) Research proposal
  (ii) CV template (PI, Co-I/Collab)
  (iii) Research Team Signatories and Other Supporting Details
  (iv) Data Sharing Plan

- Any softcopy document must be uploaded to IGMS in Word Document or PDF format (please do not submit scanned PDF format except for signatories). Please adhere to the page limit where specified and reformat softcopy such that all blank or irrelevant pages are removed.

- The applicants are required to complete the grant submission using the **IGMS online submission system**.

- Once you have completed your application in IGMS, please proceed to download a copy for your safekeeping.

- In any single grant call, each PI is allowed to submit up to one application per grant type.

- **PI's, Co-Investigators' and Collaborators' CVs are limited to 3 pages each. Please indicate NA if the required information is not applicable. Please take note that NMRC will not be responsible for any missing information not provided in the CV.**

- **Mentor's CV is limited to 2 pages (for applications involving mentor).**

- Use **Arial font size 10** for all attachment/text.

- Plagiarism (without permission from author or reference made to source) will be referred to Host Institution for investigation and may be subjected to disciplinary actions.

- Refer to Appendix 1 for details on Health Research Classification System (HRCS) to complete "HRSC Coding" sub-section in IGMS.

- Refer to Appendix 2 for checklist on Study Design and Statistical Considerations to complete "Methods/Approach" section in the research proposal.

Submission of application

- It is **mandatory** for all applications to be **submitted and endorsed** by Host Institution's Director of Research (DOR) ***online via IGMS*** by **15 August 2024, 5pm**. Internal Host Institution submission deadlines may apply, please check with your Office of Research (ORE) for more information. We will not entertain any late submissions or submissions from individual applicants without endorsement from the Host Institution. Please note that

any clarifications sought by the DOR/ORE will need to be addressed by the PI prior to submission by **15 August 2024, 5pm**.

- Please note that applications are **subject to rejection upon submission** if:
  - Any of the required documents was not submitted (Please refer to Read-Me file for the list of required documents)
  - Wrong template (e.g., outdated, different programme's) was used for any of the required documents (Please use latest templates as available in IGMS)
  - Any of the Proposal or CV documents exceeds page limits
  - Missing or incomplete declarations (e.g., past funding received, concurrent grant applications)

- No late submission or revision to the submitted application will be entertained after the closing date.

Appendix 1

HEALTH RESEARCH CLASSIFICATION SYSTEM

The Health Research Classification System is a bespoke system for classifying the full spectrum of biomedical and health research - from basic to applied - across all areas of health and disease. It was developed by the UK Clinical Research Collaboration Partners. It is supported by an online reference source and manual - "https://hrcsonline.net/".

Health Categories

Category	Includes
Blood	Haematological diseases, anaemia, clotting and normal development and function of platelets and erythrocytes
Cancer and neoplasms	All types of neoplasms, including benign - malignant cancers (includes leukaemia)
Cardiovascular	Coronary heart disease, diseases of the vasculature and circulation including the lymphatic system, and normal development and function of the cardiovascular system
Congenital Disorders	Physical abnormalities and syndromes that are not associated with a single type of disease or condition including Down's syndrome and cystic fibrosis
Ear	Deafness and normal ear development and function
Eye	Diseases of the eye and normal eye development and function
Infection	Diseases caused by pathogens, acquired immune deficiency syndrome, sexually transmitted infections and studies of infection and infectious agents
Inflammatory and Immune System	Rheumatoid arthritis, connective tissue diseases, autoimmune diseases, allergies and normal development and function of the immune system
Injuries and Accidents	Fractures, poisoning and burns
Mental Health	Depression, schizophrenia, psychosis and personality disorders, addiction, suicide, anxiety, eating disorders, learning disabilities, autistic spectrum disorders and studies of normal psychology, cognitive function and behaviour
Metabolic and Endocrine	Metabolic disorders (inc Diabetes) and normal development and function. Includes all research on pineal, thyroid, parathyroid, pituitary and adrenal glands
Musculoskeletal	Osteoporosis, osteoarthritis, muscular and skeletal disorders and normal musculoskeletal and cartilage development and function
Neurological	Dementias, transmissible spongiform encephalopathies, Parkinson's disease, neurodegenerative diseases, Alzheimer's disease, epilepsy, multiple sclerosis and studies of the normal brain and nervous system
Oral and Gastrointestinal	Inflammatory bowel disease, Crohn's disease, diseases of the mouth, teeth, oesophagus, digestive system including liver and colon, and normal oral and gastrointestinal development and function
Renal and Urogenital	Kidney disease, pelvic inflammatory disease, renal and genital disorders, and normal development and function of male and female renal and urogenital system
Reproductive Health and Childbirth	Fertility, contraception, abortion, *in vitro* fertilisation, pregnancy, mammary gland development, menstruation and menopause, breast feeding, antenatal care, childbirth and complications of newborns
Respiratory	Asthma, chronic obstructive pulmonary disease, respiratory diseases and normal development and function of the respiratory system

Skin	Dermatological conditions and normal skin development and function
Stroke	Includes both ischaemic (blood clots) and haemorrhagic (cerebral haemorrhage) strokes
Generic Health Relevance	Research applicable to all diseases and conditions or to general health and well-being of individuals. Public health research, epidemiology and health services research that is not focused on specific conditions. Underpinning biological, psychosocial, economic or methodological studies that are not specific to individual diseases or conditions
Disputed Aetiology and Other	Conditions of unknown or disputed aetiology (such as chronic fatigue syndrome/ myalgic encephalomyelitis), or research that is not of generic health relevance and not applicable to the top 19 specific health categories listed above

Overview of the Research Activity Codes

1 Underpinning Research

1.1 Normal biological development and functioning

1.2 Psychological and socioeconomic process

1.3 Chemical and physical sciences

1.4 Methodologies and measurements

1.5 Resources and infrastructure (underpinning)

2 Aetiology

2.1 Biological and endogenous factors

2.2 Factors relating to physical environment

2.3 Psychological, social and economic factors

2.4 Surveillance and distribution

2.5 Research design and methodologies (aetiology)

2.6 Resources and infrastructure (aetiology)

3 Prevention of Disease and Conditions, and Promotion of Well-Being

3.1 Primary prevention interventions to modify behaviours or promote well-being

3.2 Interventions to alter physical and biological environmental risks

3.3 Nutrition and chemoprevention

3.4 Vaccines

3.5 Resources and infrastructure (prevention)

4 Detection, Screening and Diagnosis

4.1 Discovery and preclinical testing of markers and technologies

4.2 Evaluation of markers and technologies

4.3 Influences and impact

4.4 Population screening

4.5 Resources and infrastructure (detection)

5 Development of Treatments and Therapeutic Interventions

5.1 Pharmaceuticals

5.2 Cellular and gene therapies

5.3 Medical devices

5.4 Surgery

5.5 Radiotherapy and other non-invasive therapies

5.6 Psychological and behavioural

5.7 Physical

5.8 Complementary

5.9 Resources and infrastructure (development of treatments)

6 Evaluation of Treatments and Therapeutic Interventions

6.1 Pharmaceuticals

6.2 Cellular and gene therapies

6.3 Medical services

6.4 Surgery

6.5 Radiotherapy and other non-invasive therapies

6.6 Psychological and behavioural

6.7 Physical

6.8 Complementary

6.9 Resources and infrastructure (evaluation of treatments)

7 Management of Diseases and Condition

7.1 Individual care needs

7.2 End of life care

7.3 Management and decision making

7.4 Resources and infrastructure (disease management)

8 Health and Social Care Services Research

8.1 Organisation and delivery of services

8.2 Health and welfare economics

8.3 Policy, ethics and research governance

8.4 Research design and methodologies

8.5 Resources and infrastructure (health services)

Research Activity Codes

1. Underpinning Research	**Research that underpins investigations into the cause, development, detection, treatment and management of diseases, conditions and ill health**
1.1 Normal biological development and functioning	Studies of normal biology including - genes and gene products - molecular, cellular and physiological structures and function - biological pathways and processes including normal immune function - developmental studies and normal ageing - bioinformatics and structural studies - development and characterisation of model systems
1.2 Psychological and socioeconomic process	Studies that do not address health directly but cover issues that may have a bearing on health and well-being including - perception, cognition and learning processes - social and cultural beliefs - individual or group characteristics and behaviours - politics, economies and urban development - development and characterisation of model systems
1.3 Chemical and physical sciences	Research in chemical and physical sciences that may lead to the future development of diagnostic tools or medical treatments including - bioengineering and biophysics - chemical structures, interactions and properties - molecular modelling - material science
1.4 Methodologies and measurement	Development of novel underpinning research measures and analytical methodologies including - development of statistical methods and algorithms for genomic analysis - development of mapping methodologies and novel data comparison methods - development of biological, psychological and socioeconomic research measures
1.5 Resources and infrastructure (underpinning)	- development and/or distribution of resources for use by the research community including equipment, cell lines, DNA banks, and genomic and proteomic sequence resources - infrastructure to support research networks, consortia and centres

Research Activity Codes

2 Aetiology	**Identification of determinants that are involved in the cause, risk or development of disease, conditions and ill health**
2.1 Biological and endogenous factors	Identification and characterisation of endogenous factors known or suspected to be involved in the cause, risk or development of disease, conditions or ill health including - genes and gene products, molecular, cellular and physiological structures and functions - biological factors linked to ethnicity, age, gender, pregnancy and body weight - endogenous biological factors or pathways involved in responses to infection or damage by external factors - metastases, degenerative processes, regeneration and repair - complications, reoccurrence and secondary conditions - bioinformatics and structural studies - development and characterisation of models
2.2 Factors relating to physical environment	Environmental or external factors associated with the cause, risk or development of disease, conditions or ill health including - physical agents, occupational hazards, environmental surroundings, radiation and pollution - chemicals and nutrients - infection by pathogens and studies of infectious agents
2.3 Psychological, social and economic factors	Research into psychological conditions, or research into the cause, risk or development of disease, conditions or ill health associated with social, psychological and economic factors including - individual or group behaviours and lifestyle - cultural or religious beliefs or practices - ethnicity, age and gender differences - socioeconomic factors
2.4 Surveillance and distribution	Observational studies, surveys, registries, and studies that track incidence, prevalence, morbidity, co-morbidity and mortality including ongoing monitoring of large scale cohorts
2.5 Research design and methodologies (aetiology)	Development of aetiological and epidemiological research designs, measures and methodologies including - methodological innovation and modelling complex epidemiological data - development and evaluation of novel research designs - development of epidemiological research measurements including outcome measures - development of analytical and statistical methods to understand disease cause, susceptibility and risk including genetic linkage and association studies
2.6 Resources and infrastructure (aetiology)	- development and/or distribution of resources for general use by the research community including equipment, cell lines, tissue and DNA banks, and genomic and proteomic sequence resources - infrastructure to support research networks, consortia and centres

Research Activity Codes

3 Prevention of Disease and Conditions, and Promotion of Well-Being	**Research aimed at the primary prevention of disease, conditions or ill health, or promotion of well-being**
3.1 Primary prevention interventions to modify behaviours or promote well-being	Development, implementation and evaluation of interventions to modify personal or group behaviours and lifestyles affecting health and well-being including - risk behaviours associated with diet, tobacco use, physical activity, alcohol consumption, sexual health and substance misuse - age, gender, cultural or religious practices - public health policy, health communication and educational interventions - behavioural, psychological, social and physical interventions
3.2 Interventions to alter physical and biological environmental risks	Development, implementation and evaluation of interventions surrounding physical, biological and environmental risk factors including - radiation, second-hand smoke, physical and chemical agents, occupational hazards and environment surrounding - contraceptive devices - infectious agents - policy, educational and physical interventions
3.3 Nutrition and chemoprevention	Research on chemopreventative agents and health protective effects of nutrients including - development, characterisation and mechanism of action - chemical contraceptives - testing and evaluation in model systems and clinical, applied and community settings - evaluation of evidence to inform policy
3.4 Vaccines	Research on vaccines for prevention of disease including - discovery, development and testing of vaccines and vaccination in model systems - mechanism of action - development, implementation and evaluation of vaccination programmes and studies to increase uptake - decision making, outcomes from vaccination and evaluation of evidence to inform policy
3.5 Resources and infrastructure (prevention)	- development and/or distribution of resources for use by the research community including equipment, cell lines, tissue and DNA banks - infrastructure to support research trials, networks, consortia and centres

Research Activity Codes

4 Detection, Screening and Diagnosis	**Discovery, development and evaluation of diagnostic, prognostic and predictive markers and technologies**
4.1 Discovery and preclinical testing of markers and technologies	Discovery, development and preclinical testing of novel markers (that may be derived from patient samples) and technologies for use in detection, diagnosis, prediction, prognosis and monitoring including - biological and psychological markers - diagnostic and monitoring devices, imaging, scanning, predictive and diagnostic tests - development and characterisation of models - diagnostic measures and methodologies
4.2 Evaluation of markers and technologies	Testing and evaluation of markers and technologies in humans for use in detection, diagnosis, prediction, prognosis and monitoring in clinical, community or applied settings including - assessment of sensitivity, efficacy, specificity, predictive and prognostic value, reproducibility and safety - medical devices, imaging, diagnostic and predictive tests - evaluation of diagnostic models, methods and methodologies in clinical or applied settings
4.3 Influences and impact	Studies investigating impact of screening and factors affecting uptake including - attitudes and beliefs including cultural and religious practices - issues relating to gender, age and ethnicity - genetic counselling and decision making - psychological, social and economic factors - development, implementation and evaluation of interventions to promote screening including policy, education and communication
4.4 Population screening	Studies investigating population screening programmes including - feasibility studies, pilot studies and trials - evaluation of effectiveness, benefits and economic evaluation - impact on health services and policy issues - models of population surveillance
4.5 Resources and infrastructure (detection)	- development and/or distribution of resources for use by the research community including equipment, cell lines, tissue and DNA banks, and informatics systems - infrastructure support for research trials, networks, consortia and centres

Research Activity Codes

5 Development of Treatments and Therapeutic Interventions	**Discovery and development of therapeutic interventions and testing in model systems and preclinical settings**
5.1 Pharmaceuticals	Identification and development of pharmaceutical small molecules, therapeutic vaccines, antibodies and hormones including - drug screening and development of delivery systems - mechanism of action including side effects and drug resistance - pharmacogenetics, prediction of genetic variation and responses to drugs - testing in *in vitro* and *in vivo* model systems
5.2 Cellular and gene therapies	Discovery and development of cellular, tissue and gene therapies including - gene therapy, stem cells therapy, *in vitro* fertilisation and tissue engineering - Fecal Microbiota Transplantation (FMT) - development of delivery and culture systems - testing in *in vitro* and *in vivo* model systems
5.3 Medical devices	Discovery and development of medical devices including - implantable devices, mobility aids, dressings, medical equipment and prostheses - biological safety assessments and investigation of adverse events - sterilisation and decontamination of equipment or surfaces - testing in *in vitro* and *in vivo* model systems
5.4 Surgery	Development of surgical, obstetric and dental interventions including - histocompatability, transfusions, transplantations including xenograft studies and bone marrow transplants - mechanisms of recovery, tolerance, rejection and side effects including infection - testing in *in vitro* and *in vivo* model systems
5.5 Radiotherapy and other non-invasive therapies	Discovery and development of interventions including - radiobiology, radiotherapy, radioimmunotherapy, radiosensitisers, microwaves, ultrasound, laser and phototherapy - development of delivery systems - investigation of mechanisms of action and side effects - testing in *in vitro* and *in vivo* model systems
5.6 Psychological and behavioural	Development of psychological and behavioural interventions including - cognitive behavioural therapy, electro-convulsive therapy, counselling, therapy and social interventions - testing in model systems
5.7 Physical	Development of physical interventions including - physical therapies, physiotherapy, occupational therapy, speech therapy, dietetics, exercise and osteopathy - mechanisms of action - testing in model systems
5.8 Complementary	Discovery and development of complementary approaches to conventional medical therapies including

	- hypnotherapy, meditation, massage, acupuncture and homeopathy - mechanisms of action - testing in model systems
5.9 Resources and infrastructure (development of treatments)	- development and/or distribution of resources for general use by the research community including equipment, cell lines, tissue and DNA banks - infrastructure support for networks, consortia and centres

Research Activity Codes

6 Evaluation of Treatments and Therapeutic Interventions	**Testing and evaluation of therapeutic interventions in clinical, community or applied settings**
6.1 Pharmaceuticals	Clinical application and evaluation of pharmaceutical small molecules, therapeutic vaccines, antibodies and hormones in humans including - small scale settings and pilot studies - phase I, II, III and IV trials - assessing sensitivity, efficacy, specificity, relapse, survival, therapeutic value, pharmacokinetics, reproducibility and safety - studies monitoring response, outcome, drug resistance and side effects
6.2 Cellular and gene therapies	Clinical application and evaluation of cellular, tissue and gene therapies in humans including - small scale and pilot studies - phase I, II, III and IV trials - gene therapy, stem cell therapy, *in vitro* fertilisation, tissue engineering & FMT - evaluation of applied delivery systems
6.3 Medical devices	Application and evaluation of medical devices in humans in a clinical, community or applied setting including - implantable devices, mobility aids, dressings, medical equipment and prostheses - validation of design and post market surveillance
6.4 Surgery	Clinical and applied application and evaluation of surgical, obstetric and dental interventions in humans including - small scale and pilot studies - phase I, II, III and IV trials - procedures including organ and bone marrow transplantation, tissue grafts and transfusions - monitoring outcomes, side effects and rejection
6.5 Radiotherapy and other non-invasive therapies	Clinical application and evaluation of interventions in humans including - small scale and pilot studies - phase I, II, III and IV trials - radiotherapy, radioimmunotherapy and radiosensitisers, microwaves, ultrasound, laser and phototherapy - monitoring side effects
6.6 Psychological and behavioural	Application and evaluation of psychological and behavioural interventions in humans in clinical, community and applied settings - phase I, II, III and IV trials - cognitive behavioural therapy, electro-convulsive therapy, counselling, therapy and social interventions
6.7 Physical	Testing and evaluation of physical interventions in humans in a clinical, community or applied setting including - physical therapies, physiotherapy, occupational therapy, speech therapy, dietetics, osteopathy and exercise
6.8 Complementary	All aspects of testing, evaluation and provision of complementary approaches to conventional medicine in humans in a clinical, community or applied setting including

	➕ hypnotherapy, massage, acupuncture and homeopathy ➕ issues relating to health and social services and health care delivery ➕ attitudes and beliefs of patients and health care professionals
6.9 Resources and infrastructure (evaluation of treatments)	➕ provision and distribution of resources related to clinical and applied therapeutic interventions ➕ infrastructure support for clinical and applied research networks and trials, consortia and centres

Research Activity Codes

7 Management of Diseases and Condition	**Research into individual care needs and management of disease, conditions or ill health**
7.1 Individual care needs	Studies of patients and service user care needs including ➕ quality of life, management of acute and chronic symptoms, management of side effects, rehabilitation, long term morbidity and reproductive issues ➕ psychological impact of illness ➕ social and economic consequences of ill health ➕ behaviour affecting disease management including secondary prevention, compliance to treatment and attitudes and beliefs relating to seeking treatment ➕ assessment of social care and health services needs ➕ educational or communication interventions to promote self-care or improve health care by carers ➕ impact on carers
7.2 End of life care	Studies involving all issues related to palliative care and end of life care including ➕ assessment of patient, service user and carer needs ➕ provision and evaluation of palliative and end of life care services ➕ quality of life for patients and carers ➕ evaluation of interventions for health and social care professionals ➕ social, economic and policy issues ➕ pain management for terminally ill people ➕ bereavement
7.3 Management and decision making	Studies into all aspects of management of diseases, ill health and conditions by health and social care professionals ➕ attitudes, beliefs and behaviours of health and social care professionals ➕ investigation of decision making including factors influencing diagnosis, treatment, referral and management strategies ➕ educational interventions and communication practices ➕ development of guidelines, interventions or models to assist decision making and management, including identifying symptoms, predicting outcomes and identifying individuals at risk ➕ testing and evaluating management regimes and strategies

7.4 Resources and infrastructure (disease management)	development and/or distribution of resources and equipment for use by the community including informatics systems infrastructure support for trials, networks, consortia and centres

Research Activity Codes

8 Health and Social Care Services Research	**Research into the provision and delivery of health and social care services, health policy and studies of research design, measurements and methodologies**
8.1 Organisation and delivery of services	Examining the organisation and provision of health and social care services and evaluating factors affecting the quality of care - workforce and career issues - organisation and management of services - access to health and social care and geographical variations in outcomes - effectiveness of different care settings and models of service delivery - evaluating quality of care including patient safety issues - evaluation of experiences of service users - assessment of current and future health care demands - development and evaluation of interventions to improve services
8.2 Health and welfare economics	Economic evaluation of health and social care interventions and delivery including - cost-benefit analysis of services including economic modelling - cost effectiveness or economic feasibility of implementing new interventions or technologies within health services - economic assessment of service productivity and outcomes - health care costs - development and evaluation of economic models of health care
8.3 Policy, ethics and research governance	- evaluation of local, regional and national healthcare policy - impact of legislation - synthesis and evaluation of evidence to inform policy - dissemination and implementation of research evidence - research ethics including use of personal data and biological material, consent and confidentiality - research governance and regulation processes including interpretation of guidelines - issues surrounding research subjects and donor recruitment
8.4 Research design and methodologies	Development of research designs and novel methodologies for health care including treatment, management and health services research - analytical innovation, methodological research, statistical methods and modelling - development of research measurements including outcome measures - development of methods of research assessment and evaluation - development and evaluation of research designs and methodologies
8.5 Resources and infrastructure (health services)	- development and distribution of resources for use by the community including informatics systems - infrastructure support for networks, trials, consortia and centres

Appendix 2

STUDY DESIGN AND STATISTICAL CONSIDERATIONS - CHECKLIST

All applicants must give careful thought to the following study design, methods and statistical considerations, and ensure that they are reflected in the grant application. Consider the following questions for the clinical research study design and methodological planning.

1. Is the main objective exploratory (for which a formal sample size justification is not relevant) or are you testing a quantitative hypothesis?
2. If the former, what are the population parameter/s you are trying to estimate? (E.g. annual incidence of AIDS, prevalence of teenage smokers, relative risk of a relapse etc)
3. If the latter, use the checklist below which could assist you to describe your study design and methods more clearly.
4. Some sample questions related to the check list below: (a) State the primary quantitative hypothesis (e.g. the hazard ratio is 0.5) and the required precision for the estimate in the form of a confidence interval e.g. 95% CI of the HR (0.3, 0.7)? (b) State the sample size required to achieve that precision. Be sure to specify the type 1 error, any other required assumptions needed and the sample size software / formula used in the calculation.

The following checklist provides guidelines for describing the study and design and methods as adapted from the CONSORT statement[2].

Area	Descriptor	Y/N/NA
Participants	Eligibility criteria for participants' description of settings/ locations where data are collected.	
Recruitment Methods	How will subjects be identified, enrolled and retained?	
Interventions	Detail the interventions intended for each group and how, when and by whom they are to be administered.	
Objectives hypotheses	Provide specific objectives or aims and related specific hypotheses.	
Outcomes	Clearly define primary and secondary outcome measures, AND when applicable, methods to enhance measurements quality (*e.g.*, multiple observations, assessor training).	
Sample size	How was sample size determined? When applicable, explain any interim analyses and stopping rules.	
Randomization - Sequence generation	Method used to generate the random allocation sequence, and any restrictions (*e.g.*, blocking, stratification)	

[2] The CONSORT is primarily for randomized controlled trials, but nevertheless has many features that would apply more generally to other types of clinical research projects. Visit http://www.consort-statement.org/index.aspx?o=1017 for more details.

Randomization - Allocation concealment	Method used to implement the random allocation sequence (*e.g.*, numbered containers or central telephone). Clarify whether the sequence will be concealed until interventions to be assigned.	
Randomization - Implementation	Who will generate the allocation sequence, who will enroll participants, and who will assign participants to their groups	
Blinding	How was blinding of the assigned treatment achieved for (i) subjects (ii) care-givers (iii) outcome assessors?	
Data collection	Outline how data will be collected, stored, managed. How will you ensure data quality (e.g. rater drift)?	
Adverse Events	How detected, measured, and managed?	
Study Period	When will enrollment start, stop, when is last data point?	
Statistical analyses for each hypothesis	What specific statistical analysis is planned for each primary and planned secondary hypothesis?	
Statistical Collaboration	Who provides design and statistical collaboration	