Title
Tools for monitoring loss of muscle, strength and/or physical function, to manage sarcopenia and frailty in the elderly.

Pharma company
Abbott

Disease Area
Age-related loss of muscle mass, strength and function (Sarcopenia/ Frailty)

Looking for
Easy screening/ diagnostic tools that identify people at risk of muscle mass/ strength/ physical function loss that can be easily integrated into a digital system tied to recommendations for treatment/ management to prevent progression to mobility-disability.

Description of the challenge

Age-related loss of muscle mass and strength leads to loss of physical function, a condition called sarcopenia (1,2). This condition presents major health and economic burden to society. Loss of muscle mass/strength is associated with increases risk of falls and fractures; impaired ability to perform activities of daily living. This eventually leads to mobility disability, loss of independence and eventually frailty. Risk of mortality is also increased. From health economics standpoint, loss of muscle/strength increases risk for hospitalization and increases cost of care during hospitalization.

Currently there is low awareness of age-related muscle and strength loss due to **lack of easy screening/ diagnostic tools.** Grip strength is not routinely measured outside of research settings and tools are relatively expensive for routine use in clinic. Tools to estimate lean/ muscle mass include bioimpedance analyses (BIA), dual energy x-ray absorptiometry (DEXA), ultrasound, computed tomography (CT), or magnetic resonance imaging (MRI)- but these are not yet developed for in-home or primary care physicians (PCP) use. A newer method (creatine (d3-methyl) dilution) being developed is still very expensive (3). Blood biomarkers for risk identification are in exploratory phase (4). There are no self-identification tools for people to know if they are at risk of developing sarcopenia. Exercise and specialized nutrition are the best solutions to date in mitigating progression towards mobility-disability.

We are looking for the development of the following easy screening/ diagnostic tools that provide digital feedback to the end user (consumer/physician). These tools should be able to integrate into digital support system downstream that will provide feedback/ recommendations to end user regarding management steps to prevent progression to mobility-disability.

- Rapid in-home screening tools to be used in community: Help patient self-identify their risk of muscle/ strength/ function loss- non-invasive, affordable.

- Easy screening/diagnostic tools for physicians to identify patients at risk of sarcopenia: Physician effort should be minimal to implement these tools in their practice. Needs to be validated against gold standard.

Measurements could include but not limited to muscle strength, nutrition risk, muscle mass, functional measures, wearables/ sensor technology, or biomarkers (biological samples). Tools should show high validity with established methods.

Target groups: Community dwelling older adults, assisted living/nursing home population, caregivers, PCPs, hospital and rehabilitation health care professionals, dieticians etc

1. Cruz-Jentoft A. et al (2018) Age and Ageing; 0: 1–16
2. Bhasin. S (2020) J Am Geriatr Soc, 68: 1410-1418.
3. Hellerstein M & Evans WJ (2017) Curr Opin Clin Nutr Metab Care, 20:191–200 4. Gawel S et al (2020) Clinica Chimica Acta,509,72-78

Title
Facilitate patients´ identification/screening in clinical trials

Pharma company
Amgen

Disease Area
Oncology/hematology (applicable to other therapeutic areas)

Looking for
A solution which will provide automated patients identification/screening for defined trials (inclusion/exclusion criteria, biomarkers) from patients´ files and which will help clinical trial feasibility

Description of the challenge
Clinical trials in Oncology/Hematology are competitive and more and more complex.
Patients´identification based on specific criteria / profile is a key element of site feasibility. Current solutions don't allow to estimate the recruitment's potential of a list of centers in a timely manner.
Centers of excellence or cooperative groups with large portfolio of clinical trials (academic and industrial) need support through innovative solutions to manage the **identification and triaging of patients** in defined clinical trials.
The ideal solution, therefore, should allow **better patients´identification, higher recruitment and supports data management.**
The solution ideally should include:
- **interoperability** across hospital data sources (clinical report, diagnostic imaging report, biological, cytological & histological results incl. biomarkers…) to identify a list of potential eligible patients according to a research algorithm based on inclusion criteria
- **natural language processing**

Overall, the solution would represent a key success factor for ensuring recruitment timelines (academic or pharma trials) and would ensure a better access to patients to clinical trials (between 5 – 10 % of cancer patients participate to clinical trials in France for example).

Title

Integrated Care for CKD Patients. Focus on early diagnosis and prevention of life threatening complications.

Pharma company

AstraZeneca Pharma SRL, Romania

Disease Area

Nephrology - Chronic Kidney Disease (CKD)

Looking for

Ecosystem solution to transform CKD management from prevention / screening to early stage diagnosis, treatment initiation and adequate treatment management able to prevent or slow the progression of disease.

Description of the challenge

CKD is highly under-diagnosed and under-recognized

- High prevalence: 1 out of 10 people are suffering from CKD globaly
- Low awareness: general public and policymakers don't / hardly know about CKD
- 12% CKD stage 3 cases are diagnosed and only 28% of stage 3 patients are aware of their CKD
- High cost burden: if not recognized and properly addressed there are very high annual costs for the end stage complications management (e.g dialysis and transplantation alone range between $35,000 -$100,000 per patient); so there is clear need for early diagnosis & complications prevention
- Disease management is involving more specialties which should be connected (see target groups description)

CKD requires holistic approach, starting with risk factors understanding and adequate treatment & disease monitoring.

Among the factors which lead to CKD poor clinical outcomes: fragmented & not aligned management path; patient awareness & self involvement; lack of specific symptoms in early stages; lack of standardized screening tools; management of final outcomes (dialysis, myocardial infarction, heart failure, etc) as separate events, without connection with root cause.

Recently, there were paradigm changes in CKD Guidelines, which need to be rapidly endorsed and patient access ensured.

We are looking for an **integrated care solution** consisting of **both system and patient management algorithm & tools**, including patient self monitoring tools:

- Digital solution for patients and HCPs to improve early-stage CKD Diagnosis (Diagnosis algorithm included) and monitoring

- Solution/technology to inter-connect all specialties involved in CKD Diagnosis, treatment management and monitoring, to improve kidney health, reduce demand of kidney transplants and dialysis.

Target groups: Primary Care Physicians (PCP), internal medicine, nephrologysts, cardiologysts, neurologysts, psychologysts, dietetitions, endocrinologysts.

- PCP and Internal Medicine: screening & diagnosis: quick identification & disease monitoring
- Nephrologysts: Change from being one of the involved specialties into owning the disease management
- Cardiologists / neuro /psychiatry/endocrinologysts – regular specialist consultations
- Psychologysts / dietetitians / kinetotherapysts – regular guidance & practice

Title

Digital remote monitoring & support solutions for patients living with MS (Multiple Sclerosis).

Pharma company

Merck

Disease Area

Multiple sclerosis

Looking for

The solutions would be used for monitoring disease evolution and/or patient's quality of life and/or support patients to manage symptoms and maintain high adherence to therapies.

Description of the challenge

Multiple sclerosis (MS) is a condition that can affect the brain and spinal cord, causing a wide range of potential symptoms, including problems with vision, arm or leg movement, sensation or balance. It's a lifelong condition that can sometimes cause serious disability, although it can occasionally be mild. It's most commonly diagnosed in people in their 20s and 30s, although it can develop at any age. It's about 2 to 3 times more common in women than men. MS is one of the most common causes of disability in younger adults.

The symptoms vary widely from person to person, like fatigue, difficulty walking, vision problems, such as blurred vision, problems controlling the bladder, numbness or tingling in different parts of the body, muscle stiffness and spasms, problems with balance and co-ordination, problems with thinking, learning and planning.Depending on the type of MS, symptoms may come and go in phases (relapse-remitting MS) or get steadily worse over time (progressive MS).

One of the biggest challenge with MS is the accurate and fine evaluation of the disease status in clinical trials, since tools are strongly subjective and rely on healthcare professionnals expertise and patient's feedback, lacking objectivity. At the same time, patients are interested to evaluate their disease status using technologies available to them and be more empowered. In addition, patients living with MS are struggling to get the right support when getting the medication in the real-world, both to manage their symptoms with appropriate interventions (e.g. like finding the right exercises) but also to keep track of their treatment and maintain a high adherence, which can be particulary challenging with oral medication taken very frequently since some symptoms, like problems with thinking, come into play.

The key focus on the challenge is about **digital remote monitoring & support solutions for patients with MS.** The solutions would be used for monitoring disease evolution (e.g. progression along the Expanded Disability Status Scale – EDSS – or similar for patients with progressive MS) and/or monitoring of the patient's quality of life and/or support patients to manage symptoms and maintain high adherence to therapies based on orals medication. These solutions would be used for marketed drugs in real-world environment & during clinical trials (in particular enabling decentralized clinical trials and with ecologically valid

measurements performed when the patients are at home and without surveillance of healthcare professionals).

Title

Digital and Personalized Health for Adult ADHD

Pharma company

Takeda

Disease Area

Attention deficit hyperactivity disorder (ADHD)

Looking for

A digital solution based on Gamification, AR/VR, Machine learning / Artificial Intelligence, Wearables, sensors, IoT to be used for Clinical decision-making support: Support for diagnosis, Personalised Treatment, Treatment response monitoring of ADHD in adults

Description of the challenge

Attention-deficit/hyperactivity disorder (ADHD) is a persistent neurodevelopmental disorder that affects 2.5% of adults worldwide. ADHD is characterized by inattention or hyperactivity and impulsivity, or both. ADHD is associated with impairments across multiple cognitive domains. The diagnostic criteria of ADHD require that symptoms cause functional impairments, ie. make life considerably more difficult on a social, academic or occupational level, and that symptoms have occurred before age of 12 years. However, the presentation of ADHD is very variable, with different people affected in different ways.[1]

ADHD has long been considered as children's disorder however **adults** are affected too, although their disease goes **often unrecognized and/or misdiagnosed**. There is still lack of awareness and stigma around adults with ADHD, who are often misconceived as difficult persons, inconsiderate or lazy, among other things. ADHD patients often underestimate or downplay their symptom and by adulthood have developed coping mechanisms which may eventually result in other comorbidities. **It is common that ADHD symptoms get mixed with other mental disorders, such as depression or anxiety**.[2]

Health care personnel (HCPs) may perceive diagnosing of adult ADHD as a complex and time-consuming task. There is no definite diagnostic test for ADHD such as blood test, brain scan or alike. Diagnosing adult ADHD involves comprehensive, self-reported assessment consisting of tests, interviews, tracking the symptoms to childhood years and cooperation from different health care professionals such as psychiatrists, psychologists, nurses etc.[3]

When pharmacotherapy is initiated for ADHD, treatment follow-up is often limited to monitoring adverse events and blood pressure. Importantly, treatment follow-up and optimization should be based on assessment of the core symptoms for which treatment is started in the first place, i.e. assessment of functional outcomes.

Digital solutions can offer help for clinical decision making; for example to confirm adult ADHD diagnosis, personalize the treatment with AI and to set baseline for outcome-based treatment monitoring. Data collection through wearables or game play can allow detection of behavioral patterns; thus, shortening the time to right diagnosis, treatment and streamlined processes in health care.

We believe that cumulative data and personalized digital patient journey could make a real positive impact on ADHD patients´ life.

Solutions may include, but are not limited to:
Gamification, Augmented Reality/Virtual Reality, Machine learning / Artificial Intelligence, Wearables, sensors, Internet of Things to be used for Clinical decision-making support, Support for diagnosis, Personalised Treatment, Treatment response monitoring

[1] *Faraone SV et al. Attention-deficit/hyperactivity disorder. Nat Rev Dis Primers. 2015:Aug 6;1:15020.*

[2] *Jain R, Jain S, Montano B. Prim Care Companion CNS Disord 2017;19(5):17*

[3] *American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders, 5th edition. Arlington, VA., American Psychiatric Association, 2013.*