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START-UPS MEET PHARMA

2022 CHALLENGES

SOLVE TAKEDA'S CHALLENGE IN...

RARE DISEASES, RARE BLOOD DISORDERS AND THROMBOTIC THROMBOCYTOPENIC PURPURA

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DIGITAL SOLUTIONS IMPROVING REFERRAL AND DIAGNOSTIC PATHWAY FOR RARE DISEASES

Pharma company: Takeda

Disease area: Rare diseases, rare blood disorders, thrombotic thrombocytopenic purpura (TTP)

Looking for: Digital health solutions and innovations that improve the diagnostic pathway and referral for rare diseases, with a focus on rare blood disorders.

Description of challenge

People living with rare diseases are often faced with challenges to obtain correct diagnosis, and hence treatment. Due to the rarity of the diseases, there is limited awareness and knowledge of the signs and the symptoms of rare diseases. Most physicians will only see a small number of people with a rare disease, which makes it difficult to build up the necessary clinical knowledge and experience to recognize the symptoms. [1]

We call for digital health solutions that could improve or optimize the care and referral pathway for people with rare diseases to gain access to relevant laboratory testing to enable diagnosis and treatment decision.

We are interested broadly in new innovative approaches to improve the early care pathway for people with rare diseases and are looking for solutions and teams that have capabilities that may be transferred to new therapy areas in co-creation with Takeda.

[1] Nordic Roadmap for Rare Diseases, April 12-13, 2021, https://nordicrarediseasesummit2021.com/assets/files/Nordic_Roadmap_For_Rare_Diseases.pdf; United Nations 76th General Assembly, resolution A/RES/76/132, Addressing the challenges of persons living with a rare disease and their families. 16th Dec 2021, https://undocs.org/A/C.3/76/L.20/Rev.1.

We are especially keen to learn solutions that could be applied to improve testing for Thrombotic thrombocytopenic purpura (TTP), which is ultra-rare, life-threatening blood disorder, caused by the lack or dysfunction of ADAMTS13 enzyme.[2] TTP patients face many challenges to receive correct diagnosis, and we look to identify or co-create digital health solutions and innovations that could make a difference for TTP patients throughout their patient journey.[3]

As an ultra-rare condition, few startups or research teams focus on how to improve referral pathway to accelerate taking antibody or ADAMTS13 test for TTP patients. As a rare condition, readily available solutions may be scarce, and we're interested to learn about solutions and capabilities in other therapeutic areas that could be transferred to apply within TTP, or other Rare Diseases.

What is Thrombotic Thrombocytopenic Purpura (TTP)?

- Thrombotic thrombocytopenic purpura (TTP) is ultra-rare, life-threatening blood disorder. It is caused by deficiency or dysfunction of ADAMTS13 and characterized by the formation of micro-thrombi due to platelet aggregation in small vessels. This could result in (i) low platelet count (thrombocytopenia), (ii) bleeding, (iii)tissue ischemia and (iv) widespread organ damage.
- TTP presents as one of two distinct forms: congenital (cTTP) or immune-mediated (iTTP). In the latter case the disease is caused by autoantibodies against ADAMTS13. cTTP is hereditary, whereas in iTTP the disorder is developed.

[2] https://www.nhlbi.nih.gov/health-topics/thrombotic-thrombocytopenic-purpura (19 Dec 2021).
[3] Ibidem.

- Both cTTP and iTTP patients are at risk of experiencing acute episodes requiring hospitalization and risk of acute and subacute manifestations in the short- and long-term
- TTP can be fatal or cause lasting damage, such as brain damage or a stroke, if it's not treated right away. [4]

Blood clots, a low platelet count, and damaged red blood cells cause the signs and symptoms of thrombotic thrombocytopenic purpura (TTP). The signs and symptoms of TTP include:

- Purplish bruises on the skin or mucous membranes (such as in the mouth). These bruises, called purpura, are caused by bleeding under the skin.
- Pinpoint-sized red or purple dots on the skin. These dots, called petechiae, often are found in groups and may look like a rash. Bleeding under the skin causes petechiae.
- Paleness or jaundice (a yellowish color of the skin or whites of the eyes).
- Fatigue (feeling very tired and weak).
- Fever.
- A fast heart rate or shortness of breath.
- Headache, speech changes, confusion, coma, stroke, or seizure.
- A low amount of urine, or protein or blood in the urine.
- Traumatic bleeds in children.[5]

Addressing misdiagnosis and diagnostic delays. TTP patients often face mis-diagnosis and/or delay of diagnosis, and often patients receive diagnosis only after acute episode that can present a medical emergency. TTP patients experiencing acute episodes often undergo emergency room visit and require hospitalization.[6]

[4] Ibidem.
[5] https://www.nhlbi.nih.gov/health-topics/thrombotic-thrombocytopenic-purpura (20 Dec 2021)
[6] Ibidem.

Diagnosis of TTP is confounded by many factors, such as initial symptoms may not be specific to TTP and patients may have other underlying health conditions. Diagnosis can also be difficult, as there is, for example, clinical overlap with haemolytic uraemic syndrome (HUS), autoimmune disease and a spectrum of pregnancy-related problems. Possible innovations could include, but are not limited to, solutions supporting improved recognition of TTP symptoms and diagnosis.

We are especially interested in solutions that would improve TTP diagnostics for pregnant women.[7]

Referral optimization to lower the threshold for TTP patients to be tested for antibodies and ADAMTS13. Testing for antibodies or ADAMTS13 is usually required to confirm diagnosis, and is important for treatment initiation and disease management. Possible solutions could include, but are not limited to clinical decision support and alert systems, AI, as well as new service design concepts for the diagnostic pathway.[8]

[7] Scully, M., Hunt, B.J., Benjamin, S., Liesner, R., Rose, P., Peyvandi, F., Cheung, B., Machin, S.J. and (2012), Guidelines on the diagnosis and management of thrombotic thrombocytopenic purpura and other thrombotic microangiopathies. Br J Haematol, 158: 323-335. https://doi.org/10.1111/j.1365-2141.2012.09167.x

[8] Johanna A. Kremer Hovinga, Sara K. Vesely, Deirdra R. Terrell, Bernhard Lämmle, James N. George; Survival and relapse in patients with thrombotic thrombocytopenic purpura. *Blood* 2010; 115 (8): 1500–1511. doi: https://doi.org/10.1182/blood-2009-09-243790; X. Long Zheng; ADAMTS13 testing: why bother?. *Blood* 2010; 115 (8): 1475–1476. doi: https://doi.org/10.1182/blood-2010-01-262709

SOLVE BOEHRINGER INGELHEIM'S CHALLENGE IN...

CHRONIC KIDNEY DISEASE

Co-funded by the European Union

EARLY DIAGNOSIS AND IDENTIFICATION OF RISK FOR DISEASE PROGRESSION IN CHRONIC KIDNEY DISEASE PATIENTS

Pharma company: Boehringer Ingelheim RCV

Disease Area: Chronic Kidney Disease (CKD)

Looking for: Digital diagnostic support tool to aid the early diagnosis of patients with CKD and to flag those with high risk for progression

Description of the challenge

Chronic Kidney Disease (CKD) is defined as persistent abnormality in kidney structure or function for more than 3 months. The most common causes are diabetes mellitus and hypertension. The global prevalence of CKD is around 9% and is often underrecognized by patients and clinicians. Diagnosis, staging and appropriate referral of CKD patients by primary care physicians are important elements in reducing the burden of the disease.

Functional abnormalities are typically identified through routine screening from lab parameters, taken from blood and/or urine (glomerular filtration rate, albuminuria). Early detection (stage 1-3) and management of CKD by primary care physicians are critical, because progressive CKD is associated with adverse clinical outcomes and increased mortality.

Main challenges are:

- Most patients with CKD are asymptomatic and unaware of early-stage CKD (up to 72% in patients in Germany). Fast, non-invasive screening may be important to early disease identification, risk stratification and referral to nephrologists.
- Conventional methods identify patients only at stage 3 and above, which leaves limited space for treatment.

We are looking for a digital diagnostic support tool that aids the diagnosis of new CKD patients; flags the unrecognized CKD patients – especially those with high risk for progression; could be integrated with the daily workflow of GPs. We are looking for solutions that are ready to enter EU markets in 2023.

Boehringer Ingelheim

References:

https://www.nature.com/articles/s41581-020-0268-7

https://bestpractice.bmj.com/topics/en-gb/84

https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(19)32977-0/fulltext

https://www.medrxiv.org/content/10.1101/2021.05.21.21257582v1.full

https://www.kidney-international.org/article/S0085-2538(20)31210-2/fulltext

SOLVE SINTETICA'S CHALLENGE IN...

PAIN MANAGEMENT, CHRONIC PAIN AND PERIOPERATIVE PAIN

eit Health

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INNOVATIVE SOLUTIONS FOR PAIN MANAGEMENT

Pharma company: Sintetica

Disease Area: Pain management, chronic pain, perioperative pain

Looking for: Innovative solutions for pain management spanning different approaches such as drug development, drug delivery, medical devices, IoT, digital solutions etc.

Description of the challenge

Pain is a condition common to many patients, yet there are different kinds of pain, for intensity, duration, and pathophysiology. Pain can be categorised as nociceptive (from tissue injury), neuropathic (from nerve injury), or nociplastic (from a sensitised nervous system). Additionally, when the pain persists or recurs for longer than 3 months it is referred to as chronic pain and it has a huge impact (social, psychological, and economic) on the patients' daily life. According to some studies it is estimated that 20% of the global population is affected by chronic pain.

Despite its incidence, chronic pain is currently under-diagnosed and under- or mis-treated. The main reasons for this include (i) lack of awareness of the extent of the problem among healthcare providers (ii) inadequate doctors' training in pain management (iii) incomplete understanding of the pathophysiology of chronic pain (iv) side effects of analgesic drugs.

We are looking for disruptive and truly innovative solutions in pain management, related to chronic pain but also to pain treatment in general, that could improve patients' lives.
These solutions could include but are not limited to: new types of pharmacological treatment, novel drug delivery routes, medical devices, digital approaches.
Additionally, we are also interested in the field of neuromodulation which is an expanding area of pain medicine that incorporates an array of non-invasive, minimally invasive, and surgical electrical therapies.

We are also interested in solutions that are based on a multidisciplinary approach, solutions that aim at an individualised treatment and solutions that could offer a multidimensional diagnosis.
Precedence will be given to applications that challenge the *status quo* and that are market-ready or that will be in a couple of years.
Sintetica has a scientific leadership on the production of injectable anaesthetics and analgesics delivered worldwide. Our main customers include Hospitals, Pharmacies and other Healthcare Institutions. All the proposals should clearly highlight potential benefits for Patients, Physicians, Anesthesiologists, Hospitals and Healthcare System.

References:

https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(21)00393-7/fulltext
https://www.tandfonline.com/doi/full/10.1185/03007995.2013.810615?src=recsys
https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(21)00794-7/fulltext

SOLVE NOVARTIS' CHALLENGE IN...

CARE COORDINATION BETWEEN PRIMARY CARE AND SPECIALTY CARE FOR ASCVD PATIENTS WITH ELEVATED LDL-C LEVELS

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CARE COORDINATION BETWEEN PRIMARY CARE AND SPECIALTY CARE FOR ASCVD PATIENTS WITH ELEVATED LDL-C LEVELS

Pharma company: Novartis

Disease Area: Atherosclerotic cardiovascular disease (ASCVD)

Looking for: A proven solution or platform that can support integrated care pathway including any digital health interventions to optimize patient outcome, reduce disease burden and minimize avoidable Healthcare resource utilization.

Description of the challenge

Cardiovascular disease (CVD) is the leading cause of death worldwide[6,7].Claiming more lives than all cancers combined[7], CVD contributes to one in every three deaths globally[8]. After a decline in mortality over the past several decades, the numbers are rising again. This time at an alarming rate, reversing years of progress[10,11]. A major driver of heart attacks, strokes and deaths is a type of CVD called atherosclerotic cardiovascular disease (ASCVD)[4,12]. The most readily modifiable risk factor for ASCVD is elevated LDL-C (bad cholesterol)[13,14]. The global cost of CVD will be well over one trillion dollars by 2030, and ASCVD will represent the most significant portion of this[9,12]. ASCVD is often only diagnosed after a heart attack, stroke or other CV event. Long-term exposure to high levels of LDL-C, which builds up plaque in the arteries, can lead to this disease[13]. Patients don't always experience symptoms, so many aren't aware of their increased risk of developing this life-threatening condition[13]. Fortunately, LDL-C is the most readily modifiable risk factor of ASCVD[13,14]. Unfortunately, effective and sustained LDL-C reduction remains a challenge, with 80% of people with ASCVD not achieving guideline-recommended LDL-C targets on statins alone[4,15]. Barriers include difficulties in making lifestyle changes and the inability to access some therapies or adhere to treatment[4]. These challenges underscore the significant unmet needfor a new type of medicine.

SOLVE NOVARTIS' CHALLENGE IN...

CARE COORDINATION BETWEEN PRIMARY CARE AND SPECIALTY CARE FOR ASCVD PATIENTS WITH ELEVATED LDL-C LEVELS

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We are looking for a proven solution or platform that can support integrated care pathway (screening & diagnosis / identify patient, automate referral, treatment activation and follow-up) including any digital health interventions (e.g., behavior change / psychosocial aid / adherence) to optimize patient outcome (QoL, morbidity/mortality, productivity), reduce disease burden and minimize avoidable Healthcare resource utilization.

Selection (condition of application) criteria, the product/platform:

1) Has been validated with an end user (HCP) by them actually using it; has been peer reviewed.
2) Has data to support evidence and impact.
3) Has required approvals (e.g if medical device, then approved).

References

1. Ray K, Wright R, Kallend D, et al. Two Phase 3 Trials of Inclisiran in Patients with Elevated LDL Cholesterol. *N Engl J Med*. 2020;382(16):1507–1519.
2. Raal, F, Kallend D, Ray K, et al. Inclisiran for Heterozygous Familial Hypercholesterolemia. *N Engl J Med*. 2020;382(16):1520–1530.
3. Zhang S, Liao N, Plent S. Utilization and Access to Care Among Patients with Atherosclerotic Cardiovascular Disease in the United States: Findings from the National Health and Nutrition Examination Surveys, 2011-2014. Meeting Abstracts. AMCP Managed Care & Specialty Pharmacy Annual Meeting 2018.
4. Lansberg P, Lee A, Lee ZV, Subramaniam K, Setia S. Nonadherence to statins: individualized intervention strategies outside the pill box. *Vasc Health Risk Manag*. 2018;14:91-102.
5. Desai CS, Martin SS, Blumenthal RS. Non-cardiovascular effects associated with statins. *BMJ*. 2014;349:g3743.
6. World Health Organization. *Cardiovascular diseases (CVDs)*. Available from: https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds) [Last accessed: September 2020].
7. American Cancer Society. *Global Cancer Facts & Figures 4th Edition*. Available from: https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/global-cancer-facts-and-figures/global-cancer-facts-and-figures-4th-edition.pdf [Last accessed: August 2020].
8. Joseph P, Leong D, McKee M, et al. Reducing the Global Burden of Cardiovascular Disease, Part 1: The Epidemiology and Risk Factors. *Circ Res*. 2017;121(6):677-694.
9. World Economic Forum. *The Global Economic Burden of Non-communicable Diseases*. Available from: https://www.weforum.org/reports/global-economicburden-non-communicable-diseases [Last accessed: March 2020].
10. British Heart Foundation. *Heart and circulatory disease deaths in under 75's see first sustained rise in 50 years*. Available from: https://www.bhf.org.uk/what-we-do/news-from-the-bhf/news-archive/2019/may/heart-and-circulatory-disease-deaths-in-under-75s-see-first-sustained-rise-in-50-years [Last accessed: September 2020].
11. Shah NS, Lloyd-Jones DM, O'Flaherty M, et al. Trends in Cardiometabolic Mortality in the United States, 1999-2017. Research letter. *JAMA*. 2019;322(8):780-782.
12. World Health Organization. *Cardiovascular disease New initiative launched to tackle cardiovascular disease*. [Last accessed: March 2020].
13. Ference BA, Graham I, Tokgozoglu L, Catapano AL. Impact of Lipids on Cardiovascular Health: JACC Health Promotion Series. *J Am Coll Cardiol*. 2018;72(10):1141-1156.
14. Mach F, Baigent C, Catapano AL, et al. 2019 ESC/EAS Guidelines for the management of dyslipidaemias: lipid modification to reduce cardiovascular risk. *Eur Heart J*. 2020;41(1):111-188.
15. Bruckert E, Parhofer KG, Gonzalez-Juanatey JR, et al. Proportion of High-Risk/Very High-Risk Patients in Europe with Low-Density Lipoprotein Cholesterol at Target According to European Guidelines: A Systematic Review. *Adv Ther*. 2020;37(5):1724–1736.