

Welcome

ATHENA has entered its final year. Our goal for 2023 is to bridge the gap between the innovative research performed by our partners and its application in a hospital setting. This newsletter showcases the efforts of the ATHENA consortium in establishing a robust application of machine learning for treating multiple myeloma, while also discussing the challenges that need to be addressed for its successful broader implementation.

Senior Director Health Information Sciences at Janssen



Bart Vannieuwenhuyse ATHENA project lead

Read more

A perfect match between multiple myeloma and project ATHENA



therapies available for our patients" Prof. dr. Michel Delforge, UZ Leuven

"Real-world data helps us navigate through a multitude of

Project ATHENA aims to demonstrate the potential of real-world data and

applicability of federated learning by focusing on two actual medical conditions bladder cancer and multiple myeloma. Prof. dr. Michel Delforge is hematologist at UZ Leuven, specializing in multiple myeloma, and chairman of the Leuven Cancer Institute. In this interview, he explains how he and his team use real-world patient data to guide treatment decisions and optimize care. What are the current challenges in multiple myeloma care that need attention?

In the past, multiple myeloma was an acute, life threatening disease. Thanks to significant recent advancements in medical technology, it has now become a manageable chronic condition for several patients. Although we are still unable to treat the disease, we currently

have a multitude of therapies to improve our patients' prospects and quality of life. Selecting the ideal strategy for each individual patient is a complex process and requires insights in patient response and confounding factors, information which is very difficult to extract from clinical study data. Secondly, with these novel treatment methods, healthcare costs have

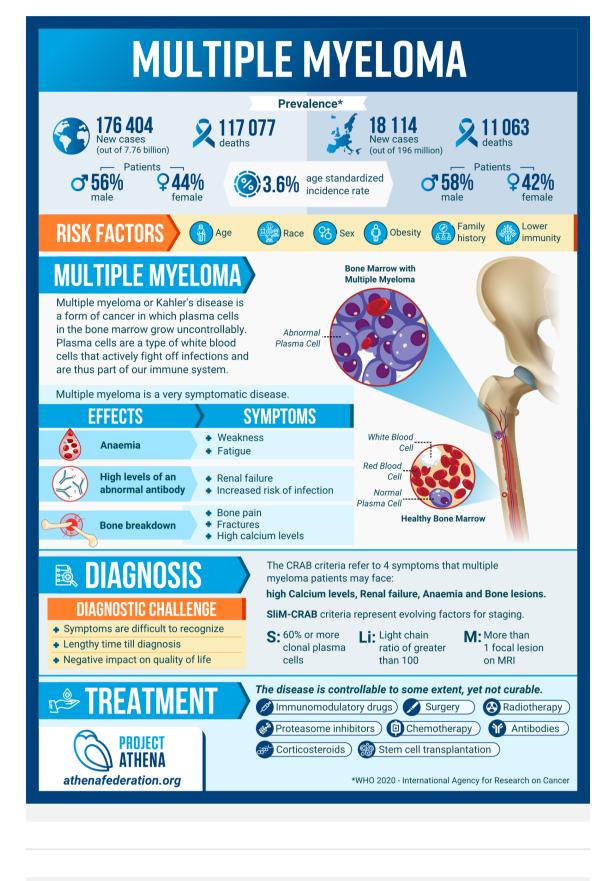
also significantly increased. For health insurance funds to manage this financial impact, it is vital that we specifically save targeted therapies for those patients most likely to benefit. How can real-world data help to link patients to therapy strategies? Data available from published clinical trials can help, but is limited due to strict inclusion criteria and lack of longitudinal follow-up information on remission or relapse. It is, thus, more interesting to collect real-world data from your own patient population. However, in a standard hospital setting, patient data is not always collected in a structured manner. To circumvent this, we have established our own database containing standardized and complete information on multiple myeloma patients. With project ATHENA, we found a true

match in our endeavors. Based on collaborative efforts from consortium partners, we can

What do we need to stimulate similar initiatives in other disease areas?

now collect and analyze data in a more efficient and granulated manner.

Following the establishment of our multiple myeloma patient database and its success, we have now also launched similar projects for other cancer types, such as leukemia and lymphoma. Installation of such systems is, however, not easy. It is absolutely vital that you create a supportive environment in your local institution. The hospital management, ethical committee, IT department, and medical staff are essential stakeholders to have on board. Great value can be added by expanding partnerships with patient organizations, governments, and pharmaceutical companies. Effective communication, information sharing, and active engagement are crucial in convincing stakeholders of these initiatives' significance. Presenting clinical research questions in a comprehensible manner and supporting them with tangible results is the way to go.





Meet your ATHENA colleague!

information by analyzing and visualizing it in dashboards. We work on educating and stimulating physicians to register data in a structured way, to build a data-supported culture. We work with pharma, industry, universities and other hospitals and try to be

a role model in secondary use of data. In which way can ATHENA help to integrate real-world data use in the clinic? By using data registered in EMRs, the physicians see that there is more potential

then just the primary use of data. Seeing a concrete use case of the potential of the

secondary use.

of the European Health Data Space.

How can we convince more people of the added value of data re-use in clinics? Make sure there is funding. Most hospitals do not have a data science team. Data scientists are much asked profiles, who can choose where to work.

What are the challenges of implementing this RWD system on a larger scale? Data quality is an ongoing journey and sometimes even a struggle. Further, the government does not seem to have a clear vision or roadmap on how to proceed.

There is also no communication to hospital management to prepare for the tsunami

Implementation of machine learning in

intensive care units

Opportunities and obstacles



Why did you specifically study AI implementation in an ICU setting? Within the ICU department, patients are monitored extremely closely, leading to large amounts of real-time data. Despite the large quantity of data available and the myriad of models for analysis proposed in literature, application of AI in the ICU is still unusual. Were your assumptions about the scarce adoption of AI in ICUs confirmed?

Yes, we confirmed that AI-driven solutions in ICU patient care are indeed rare. In fact, none of the ICUs we consulted currently integrates an AI component into their IT workflow. Remarkably, 39 of our 40 participants do agree that AI-driven patient care has the potential to create innovation in healthcare.

setting were they were developed to the care context were they need to be used), reliable, or explainable. Other blocking factors concern privacy, data protection, and interoperability. Different hospitals use different types of data registration systems. Non-technical barriers include lack of funding for digitalization and a rigid culture of doctor-knows-best. What do we need to overcome these obstacles and start benefiting from Al in ICUs?

What are the main barriers for smooth AI implementation in ICU departments?

publications and the generally 'dirty' real-world data available in the clinic. There are

There is a great discrepancy between the clean research data used in scientific

issues with models from literature not being actionable, generalizable (from the

learning algorithms which have to deal with the reality of cross-institutional data silos to mitigate the lack of sufficient data for training, and the discrepancy between clean research data and dirty real-world data. Techniques for privacy-preserving learning over multiple parties, such as federated learning, can be a solution when there is too little data available at one single medical site. Also financial and legal aspects need

to be considered. In general, non-academic hospitals struggle to secure funding for

Some of the technical obstacles, such as the interoperability of data sources, need extended engineering efforts. Others require innovation at the level of the machine

such initiatives. The advent of MEDVIA, the Flemish medtech innovation cluster, has proven to be a significant aid in this regard. Finally, we need to invite all stakeholders at the table, as integration of data science in a clinical setting is a cross-disciplinary mission. Read the full article here Where are we now? Scientific

Testing

High quality data set harmonized and quality checked for multiple myeloma

Pipeline for genomic data integration being

Analysis

Retrospective protocols approved in all hospitals Clinical EHR data harmonized in multiple hospitals Prospective protocol bladder cancer approved in UZ First prospective data collection started euven, submission in progress in other hospitals extracted for bladder

Data

cancer

ATHENA is out there!

ATHENA project presented @ VAIA workshop February 24, Leuven, Belgium

Valerie Vandeweerd (Scientist physician at Janssen Clinical Innovation) and Charlotte Herzeel (Senior researcher at imec) presented project ATHENA at the VAIA course on Medical Times Series Mining. **Interesting for ATHENA followers**

April 18-19, Düsseldorf, Germany Valerie Vandeweerd (Scientist physician at Janssen Clinical Innovation) presented project ATHENA in Düsseldorf, Germany.

EUROPEAN CLINICAL TRIALS INNOVATION PROGRAMME

ATHENA present at European

Clinical Trials Innovation Programme

Coming up **EHA Congress**

MIE Conference May 22-25, 2023 Gothenburg, Sweden --- Medical informatics **ESHG Conference** June 10-13, 2023 Glasgow, UK

June 8-11, 2023 Frankfurt, Germany --- Clinical hematology **OHDSI Symposium** July 3, 2023 Rotterdam, The Netherlands --- Health data sciences

September 13-15, 2023 Limassol, Cyprus --- Conformational and probabilistic prediction

--- Human genetics

COPA Conference

Abstract deadline: May 10, 2023

ESMO Congress

Madrid, Spain

October 20-24, 2023

--- Clinical oncology

Save the date!

November 23, 2023 Leuven, Belgium MEDVIA further details!

Data driven Innovation in Personalized Medicine

and Care





supported projects in the ICON call on personalized medicine (ref. HBC.2019.2528). ICON (Interdisciplinary Cooperative Research) is a formula for demand-driven, cooperative research, such as presented in project ATHENA. FLANDERS
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