LynxCare

Use case: Cardio

“EVERY HOSPITAL SHOULD FOLLOW EVERY PATIENT IT TREATS LONG ENOUGH TO DETERMINE WHETH-ER THE TREATMENT HAS BEEN SUC-CESSFUL, AND THEN TO INQUIRE “IF NOT, WHY NOT” WITH A VIEW TO PREVENTING

SIMILAR FAILURES IN THE FUTURE.”

ERNEST ARMORY CODMAN, M.D
1914, HARVARD MEDICAL

ABOUT US

OUR COMPANY

Founded: Q4 2015

Locations:

Europe/Leuven

US/San Francisco

WHAT WE DO

Use NLP & Machine Learning to provide careproviders with the insights they need to opimize the qualithy of care.

LynxCare provides physicians a digital data assistant that automatically processes patient records, provides information and follows-up on the patient's care.

We built breakthrough clinical NLP & AI technology making both clinical and patient information readily available at the point of care, allowing for improved outcomes and practice efficiency.

PROBLEMS we are tackling

Medical administration consumes 15-20% of physicians' time and 20-30% hospitals' budgets, worldwide. This workload is increasing fast as payers require additional outcome data and patient follow-up from providers. Both large hospital chains and small outpatient clinics struggle: they urgently need automation of clinical administration.

Current solutions, e.g. Computer-Assisted Coding, have been developed with a focus on alleviating financial, e.g. billing, rather than clinical administrative burden. The multitude of data sources and their integrations on top of the contextual specificity for solutions to operate in, prevented their full automation thus far.

Cardio Use Case

“The right data in the right format, at the right time and in the right hands”, Johan Hellings, CEO AZ Delta 18.11.2017

CLIENT

The cardiology network of AZ Delta (Belgium) consists of 40 interventional cardiologist & cardiologic surgeons and is the biggest cardiology network of Belgium. As they are in the forefront of new innovations for optmimized care they wanted to benchmark their quality indicators in comparison with other international hospitals as well as have more insights into the optimal approach in aortic valve replacement for certain patient populations based on outcome data. As they did not have a magic button to get all the analytics out of their hospital information system, they contacted LynxCare to do the job ...

NEED

For the retrospective data processing study, patients who underwent aortic replacement with coronary artery bypass surgery between January 2012 and October 2017 were identified on the basis of invoiced RIZIV nomenclature. Subsequently, the vital status was obtained via the State register and the database was completed with the admission, discharge data and available ICD-9 and ICD-10 MKG data available in the hospital information system. We used LynxCare’s text mining technology (NLP) to extract the relevant clinical basic conditions and clinical outcome indicators from the operation, observation and consultation reports in the electronic patient records and to automatically convert them into Snomed CT and ICD-10 codes. The quality of automatic data extraction could be tested on the basis of the prospective collected data in the Cardiosurgical database.

Some Numbers

After adjusting our context specific natural language processing engine to the respective coding system and outcome dataset we started processing the structured and unstructured data points with timely quality checks.

1000 PATIENTS

40 000 PATIENT RECORDS

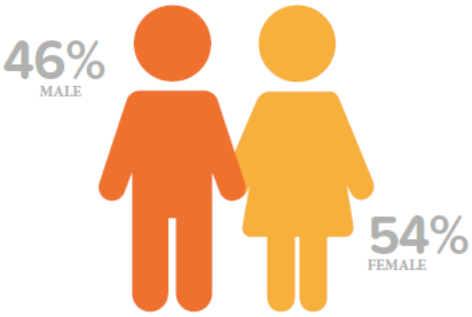
2 WEEKS FROM DATA ACQUISTION TILL DATA REPORTING

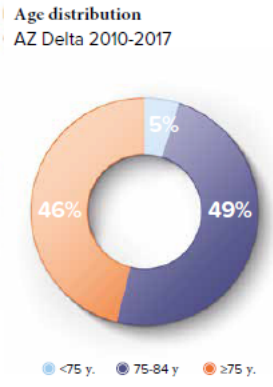
RESULTS

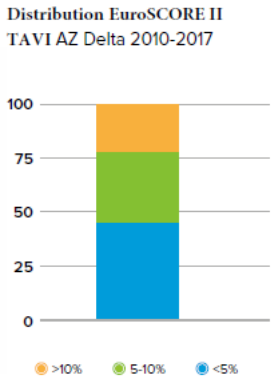
The full hospital report can be downloaded via the link on our website. We've added the most significant insights in the next two pages.

EFFICIENT HIGH QUALITY DATABASE

For all patients who underwent aortic valve replacement surgery between January 2012 and October 2017 LynxCare's text mining technology (NLP) was used to extract the relevant clinical basic conditions and clinical outcome indicators from the operation, observation and consultation reports in the electronic patient records and to automatically convert them into Snomed CT and ICD-10 codes. The quality of automatic data extraction was confirmed/assured based on the prospective collected data in the Cardiosurgical database. In addition, statistical analyses were performed







QUALITY BENCHMARKING

The following graphs are only a small part of what was provided to the physicians via the LynxCare platform. Based on the analyses, the cardiology department could conclude that their outcomes were comparable or at the upper part of the benchmark (14 Dutch Centers of Meetbaar Beter 2016, MB 2016) and they got the needed insights to explain why in certain cases their outcomes were significantly different. For example, the total uncorrected postoperative morbidity after AVR in AZ Delta 2012-2017 is comparable to that of the 14 Dutch heart centers in MB 2016 (see Figure 2). However, the uncorrected 120d mortality after AVR in our patients is relatively high and can be explained since the AZ Delta patients are older, have a higher comorbidity (diabetes, kidney insufficiency) and more often undergo emergency surgeries (see figures here under).

Figure 1. Long-term survival of total TAVI population in the Dutch Cardiology Centers of MB 2016 and AZ Delta

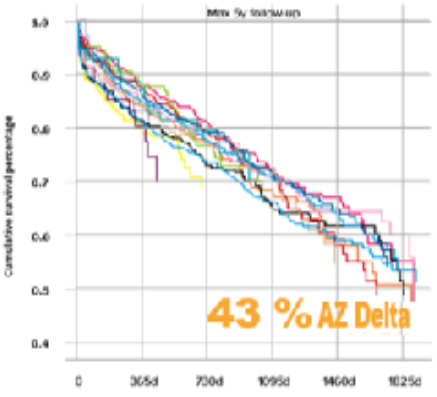


Figure 2. Long-term survival after AVR in the Dutch Cardiology Centers of MB 2016 and AZ Delta

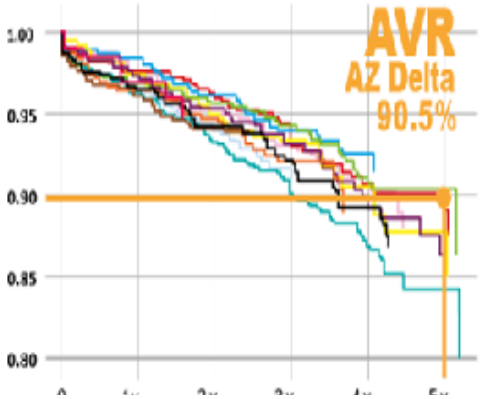
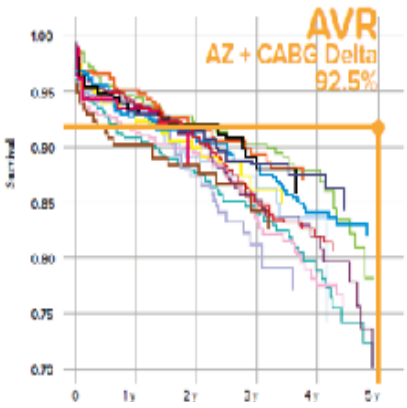
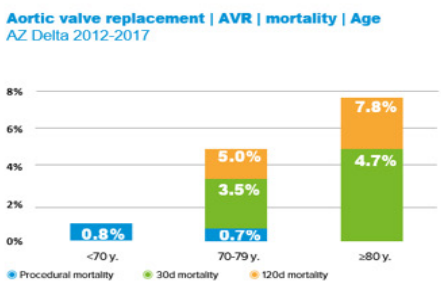


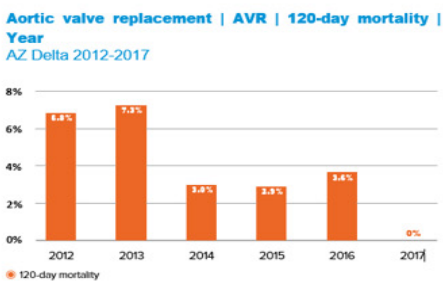
Figure 3. Long-term survival after AVR + CABG in the Dutch Cardiology Centers of MB 2016 and AZ Delta

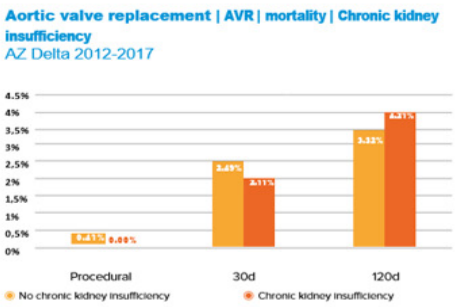


DATA DRIVEN OPTIMIZATION OF CARE PATHWAY

These detailed insights are used to improve the care pathways and selection of patients for certain procedures, e.g. should we use a percutaneous or a surgical aortic intervention in the case of an 82y old lady. In each care pathway a number of attention points are discussed in the different phases of a procedure (e.g. TAVI): preparation of a procedure, the procedural aspects and aftercare. This is information that, in some cases, can already be provided by the general practitioner and other care givers. Therefore, good communication within a multidisciplinary team and all care givers is key.







VALUE LYNXCARE FOR THE CARDIOLOGY DEPARTMENT

1. Faster access to insights

In a hospital department LynxCare is able to free 2 FTE's on administration to allocate on patient care. In terms of time savings LynxCare was able to reduce the workflow (from data extraction to data analyses) for the AZ Delta cardiology department from 4-6 months to 2 weeks. As a result, the access to insights was significantly faster using LynxCare.

2. Drive excellence

The obtained results and insights of the cardiology report were presented at a conference to different stakeholders (other cardiology centers, government, insurance, patients). They were able to prove their status as a center of excellence in cardiology showing high quality and safety metrics. Using LynxCare they could process the huge amount of data in only 2 weeks while ensuring the completeness, consistency, and accuracy of data.

3. Benchmark opportunities/competition

Physicians/hospitals that have gathered and processed the clinical data can easily compare their outcomes to the benchmark (e.g. ICHOM) in that disease area. This cardiology department could demonstrate good outcomes compared to the Dutch benchmark (Meetbaar Beter 2016) which gives them a competitive advantage.

4. Negotiation Power

The clinical data and insights are often lacking in negotiations with insurance and employers. In this cardiology center 20 percutaneous valves were eligible for reimbursement since 2016. However, the number of patients was twice as high and will probably continue to rise in the future. As their results endured the test with other centers, the clinical data and insights are provided to the insurance (government in Belgium) so that they hopefully will continue to fully support the reimbursement of percutaneous valve procedures

“INFORMATION FOR DECISIONS THAT MATTER “

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