Watson Health Oncology

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Computerlæge imponerer kræftlæger på Riget

Watson er navnet på den supercomputer, der i løbet af oktober har været på prøve i Onkologisk Klinik på Rigshospitalet.

Anne-Line Budolfen | 31/10/2016

Kunstig intelligens i en supercomputer kan give lægerne direkte adgang til store datasets og sparring, når de skal vælge behandlings-strategier.

I en måned har IBM's supercomputer, Watson, været i praktik hos Rigshospitalets kræftlæger, hvor de har testet dens intelligens på tre forskellige kræftformer: Lungekræft, brystkræft og kræft i tvk- og endetarm.

Riget er klar til Dr. Watson

IBM's supercomputer Watson har været i praktik på en af Rigets kræftafdelinger, og hospitalet er nu særligt åbne overfor at lukke kunstig intelligens indenfor murene
Strategic Context: Healthcare knowledge sources have grown beyond human cognition...

Proliferation of medical literature is accelerating

~700 K new scientific articles / year

Institutional Knowledge & Best Practices
... and vast amounts of data that can have a great impact on our health remains untapped.

**Health Determinants**

- **60%** Exogenous Factors
- **30%** Genomics Factors
- **10%** Clinical Factors

**Data Generated**

- **1,100 Terabytes**
- **6 Terabytes**
- **0.4 Terabytes**
It begins with the power of Watson

- Understands, reasons, learns and interacts
- Extracts and derives meaning from structured and unstructured content – at scale
- Provides analyses across vast arrays of criteria to transform decision-making
- Dynamically updates hypotheses based on variable chains of evidence
- Harnesses entire bodies of knowledge
## Solution Landscape for Oncology

### Cognitive Platform for Oncology

<table>
<thead>
<tr>
<th>Insights Patient Record</th>
<th>Investigational Therapies (CTM)</th>
<th>Investigational Studies (CTMi)</th>
<th>Standard of Care (Oncology)</th>
<th>RWE Insights</th>
<th>Genomic Interpretation</th>
<th>Medical Imaging Insights</th>
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<tbody>
<tr>
<td>Increase efficiency</td>
<td>Identify trials</td>
<td>Improve Trial Strategy</td>
<td>Improve adherence to</td>
<td>Efficiently</td>
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<td>Reduce misdiagnosis</td>
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- RWE Insights: Efficiently transform large data sets to evidence.
- Genomic Interpretation: Improve efficiency and effectiveness of MTRB.
- Medical Imaging Insights: Reduce misdiagnosis.
- Investigational Studies (CTMi): Improve adherence to evidence, reduce care disparity.
- Investigational Therapies (CTM): Identify trials, increase enrollment.
- Insights Patient Record: Increase efficiency, surface actionable insights from a longitudinal patient record.

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Investigational Therapies (CTM)

- Identify trials
- Increase enrollment

Investigational Studies (CTMi)

- Improve Trial Strategy
- Analyze Populations

Standard of Care (Oncology)

- Assesses relevant information for patient discovery.
- Analyze evidence for treatment options

RWE Insights

- Efficiently transform large data sets to evidence

Genomic Interpretation

- Improve efficiency and effectiveness of MTRB

Medical Imaging Insights

- Leverage cognitive insights that assist in diagnosis of medical images
Watson for Oncology

Cancer is one of the leading causes of death in the world, and in the next decade, demand for treatments is expected to grow by 42% creating a shortage of 1500 oncologists. Meanwhile, medical information is expected to double every 73 days by 2020, making it even more difficult to keep up with the latest treatment options.

Offering
Encapsulates the knowledge and experience of the specialists at MSK to enhance clinical decision making

Benefit
Provides oncologists assistance to make more informed, personalized treatment decisions
Watson for Oncology helps medical oncologists and their care teams address these challenges.

Watson for Oncology

1. Extract key attributes from the patient’s case

Patient Case
61 y/o woman s/p mastectomy is here to discuss treatment options for a recently diagnosed 4.2 cm grade 2 infiltrating ductal carcinoma...

2. Use key attributes to find candidate treatment options as determined by consulting NCCN Guidelines and MSK expertise

Key Case Attributes

3. Search the corpus for supporting evidence for each option

Evidence
- Inclusion / exclusion criteria
- Comorbidities
- Contraindications
- MSK treatment preferences
- Drug information
- Published literature - studies, reports, opinions from Textbooks, Journals, Manuals, etc.

4. Use Watson’s scoring algorithms to prioritize treatment options

Candidate Treatment Options

Guidelines

Prioritized Treatment Options + Evidence Profile
DEMO
Watson Oncology Use Cases

Point of Care Treatment Decision Support

Tumor Boards / Multi Disciplinary Meetings

Support for Resident / Fellow Training
Tak

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