



Clinical decision support

Foreword

Key studies:
Clinical decision support
Clinical trials
Genomics

Bibliography

Many early publications pertaining to Watson for Oncology (WfO) decision support were feasibility studies, looking at the concordance of WfO recommendations relative to those of individual tumor boards in countries around the globe. In some cases, clients have demonstrated rates of concordance between Watson for Oncology and local tumor boards at rates in excess of 90%. Even more important than concordance, however, is the opportunity for a decision support tool to inform treatment decisions. In two of the studies that follow, physicians reviewed and ultimately chose treatments that they had not previously considered based on recommendations from WfO.^{15,16}

Other studies reflect potential use cases for WfO to address variability of care, demonstrate shared decision making, support evidence curation, boost patient confidence in their care plans, and improve physician and patient satisfaction.

Artificial intelligence-driven oncology decision support that brings sub-specialized expertise to practitioners with global reach is a novel endeavor. The ongoing enhancement of WfO is a journey that we carry out in close partnership with physician users across the globe.

¹⁵ Jiang Z et al. Concordance, decision impact and guidelines adherence using artificial intelligence in high-risk breast cancer. *J Clin Oncol.* 2018;36 (suppl; abstr e18566).

¹⁶ Lee KA et al. Concordance, Decision Impact, and Satisfaction for a Computerized Clinical Decision Support System in Treatment of Lung Cancer Patients. *European Lung Cancer Congress*; April 11, 2019; Geneva, Switzerland

The establishment of a new medical model for tumor treatment combined with Watson for Oncology, MDT and patient involvement*

Fang J et al. ASCO Annual Meeting 2018

*no contributing IBM author

[Link to study →](#)

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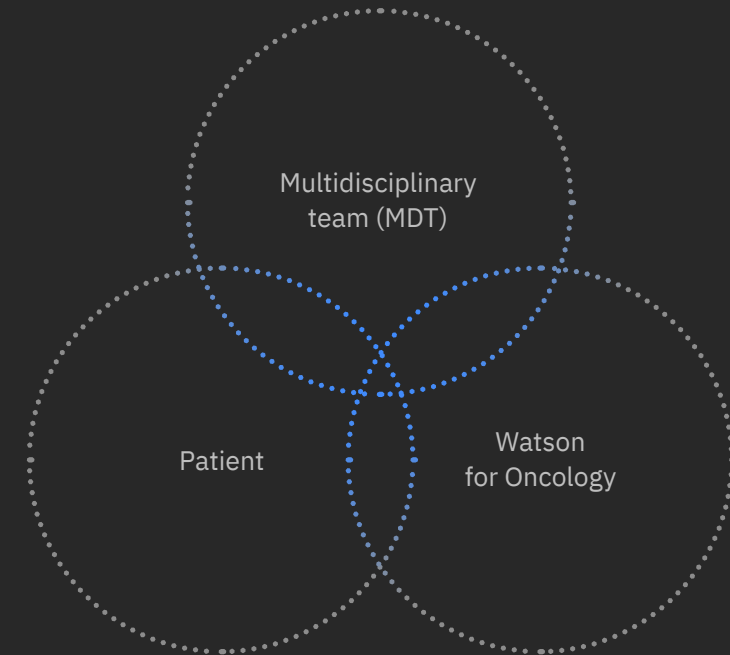
The new model combined with human brain, artificial intelligence (AI) and cancer patients enriches the traditional MDT [multidisciplinary team] model. It is a new kind of medical model which is more effective.

Excerpt from abstract

Doctor and patient survey results indicated:

Standardization and personalization of treatment recommendations

Greater patient engagement in decision making



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An evaluation of artificial intelligence-based clinical decision supports use in Brazil

Rocha H et al. ASCO Annual Meeting 2019

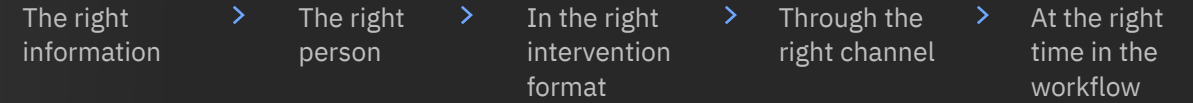
[Link to study →](#)

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In this study base[d] on an established framework for evaluation, oncologists felt WfO met the Five Rights for CDS.

Excerpt from abstract

The Clinical Decision Support (CDS) Five Rights framework¹⁷:



The goal of the study was to investigate how the implementation of Watson for Oncology (WfO) affects clinical decision-making and workflow at the Instituto do Câncer do Ceará in Brazil.

71.4% expressed positive statements pertaining to the use of WfO

The results from 7 oncologists who were surveyed on the use of Watson for Oncology and the CDS Five Rights Framework found:

86% agreed that WfO provides actionable information about treatment decisions

86% agreed that WfO provides information about treatment decisions at the right time in a clinician's work flow

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17 AHRQ. Section 2—Overview of CDS Five Rights. ibm.biz/CDSFiveRights Accessed April 20, 2019

Enhancing evidence-based medicine skills in oncology training with cognitive technology

Chen CY et al. ASCO Annual Meeting 2019

[Link to study →](#)

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These preliminary results are consistent with better learning outcomes for students using WfO in the colon cancer module.

Excerpt from abstract
Study was performed in a non-clinical setting

Traditional search methods (TSM) for identifying evidence to inform practice are complex. Cognitive technology may offer an alternative approach.

Watson for Oncology training
50 medical students

TSM
n=25

WfO
n=25

Colon cancer assessment
WfO outperformed TSM
(p=0.001)

Lung cancer assessment
No difference

Student search preference by level of clinical experience

Clinical experience

Preference

Less

Watson for Oncology

p=0.002

More

Traditional search

p=0.005

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Use of machine learning to identify relevant research publications in clinical oncology

Suarez Saiz F et al. ASCO Annual Meeting 2019

[Link to study →](#)

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The use of machine learning to identify relevant publications may reduce the time clinicians spend finding pertinent evidence for a patient.

Excerpt from abstract

A model was trained, using abstracts and titles from PubMed, to identify relevant clinical papers based on articles cited by 3 expert oncology sources:

NCCN
NCI-PDQ
Hemonc.org

Balanced training data:

On-topic set: cited in at least two expert sources

Off-topic set: published in lower-ranked journals

988 papers were classified with:

0.93
accuracy
(95% CI, 0.9–0.96; $p < 0.0001$)

0.95
sensitivity

0.91
specificity

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