Artificial Intelligence in MDS Practice

Aziz Nazha, MD

Staff, Department of Medical Oncology, Thomas Jefferson University
Global Head, AI Innovations Institute, Incyte
Global Executive Director, Early Drug Development, Incyte
Disclosures

Employee at Incyte Pharma, owns stock

Previous employee at Amazon, owns stock
Road Map

✓ Where do we stand in 2023?

✓ The future is Gen AI

✓ ChatGPT and its application in healthcare

✓ AI 4 Healthcare
Where is AI in 2023?

“It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, it was the season of light, it was the season of darkness, it was the spring of hope, it was the winter of despair.”

— Charles Dickens, A Tale of Two Cities
It is the best of time to do AI in Healthcare

Big Data
Computational Power
Early Success

FDA cleared algorithms
AI designed drugs in development
It is the worst of time......
Is AI New?

Obtained from google Images
Myelodysplastic Syndromes

**Diagnosis**

**Staging**

**Treatment**

**Higher Risk**
- Transplant
- Azacitidine
- Decitabine

**Lower Risk**
- Supportive care
- Growth factors
- Other
Myelodysplastic Syndromes + ML

**Diagnosis**


**Staging**


**Treatment**

- Nazha A, et al. JCO Precision Oncology 2019
- Radakovich N, et al. iScience 2022
The Future is Gen AI

(ChatGPT)
Generative AI

- Text to Text: Text summarization, Generation, Conversational, Question Answering, Classification, Translation
- Text to Image: “Draw a cartoon of giraffe with a headphone”
- Text to Video
- Text to Code: “how to drop a column in python”
Generative AI

Image to Text

Image to Image

Image modification
WHERE IS GEN AI TODAY?

Watch how AI completely transforms this soccer field
WHERE IS GEN AI TODAY?

Meta AI research
AI VS. HUMANS

Will humans ever beat robots? Is this only the beginning?
What is so special about ChatGPT?

- ChatGPT currently has over 100 million users
- In just 5 days, ChatGPT surpassed 1 million users
- Openai.com gets approximately 1 billion visits per month
- Over 60% of ChatGPT's social media traffic comes via YouTube
- Over 15% of ChatGPT's users are American

Obtained from: https://explodingtopics.com/blog/chatgpt-users
ChatGPT 4 Healthcare

Chatbot for Q&A for physicians and patients

Research partner

Productivity partner
ChatGPT as Q&A partner

Use of Artificial Intelligence Chatbots for Cancer Treatment Information

Chen S et al, JAMA Oncology 2023
Challenges and Limitations (Healthcare)

- Validation and accuracy
- Social biases
- Privacy
- Cost
Aziz: “how can we target TET2 mutations in acute myeloid leukemia”

ChatGPT: There are several strategies that can be used to target TET2 mutations in acute myeloid leukemia (AML). Some of these include:
1. Targeted therapies: Researchers are currently developing drugs that specifically target TET2 mutations. One example is the drug guadecitabine (SGI-110), which is designed to target AML cells with TET2 mutations and has shown promise in clinical trials.
2. Immunotherapy: Immune checkpoint inhibitors like anti-PD1/PDL1 antibodies can be used to stimulate the immune system to attack AML cells with TET2 mutations.
3. Gene editing: CRISPR-Cas9 technology can be used to edit the TET2 gene in AML cells and restore its normal function.
4. Chemotherapy: Although chemotherapy is not specific to TET2 mutations, it can still be a useful treatment option for AML patients with TET2 mutations. However, the risk of relapse is higher in these patients.
5. Allogeneic stem cell transplantation: This treatment involves replacing the patient's diseased blood-forming cells with healthy ones from a donor. It can be an effective treatment for AML, including for those with TET2 mutations, but carries a risk of serious complications and is used primarily in young and fit patients.
What is AI for Healthcare?

Build Talent

Healthcare focused courses

Global Interest

Map obtain from Google analytics within 14 days of releasing the course via social media
Conclusions

✓ AI is changing our lives
✓ GenAI will significantly impact our lives
✓ AI will impact MDS and cancer research