I Save lives.. What is your special power

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TEXAS TECH UNIVERSITY HEALTH SCIENCES CENTER™

Precision Medicine in Pediatric Leukemia

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24th Texas Llano Estacado Oncology Symposium

Transforming Cancer Care for a Better Tomorrow

October 2025

Conflict of interest

- None to disclose

http://www.wired.com/wiredscience

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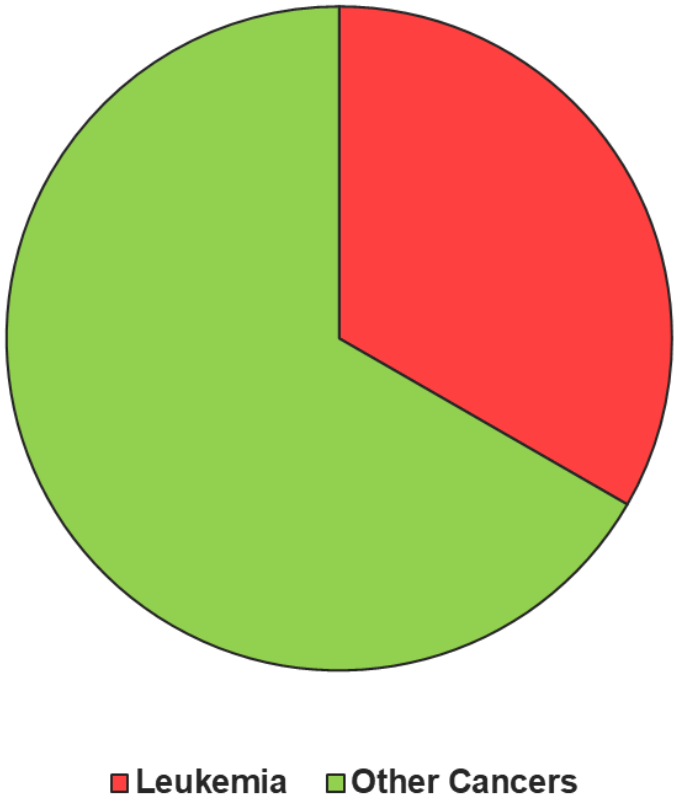
Objectives:

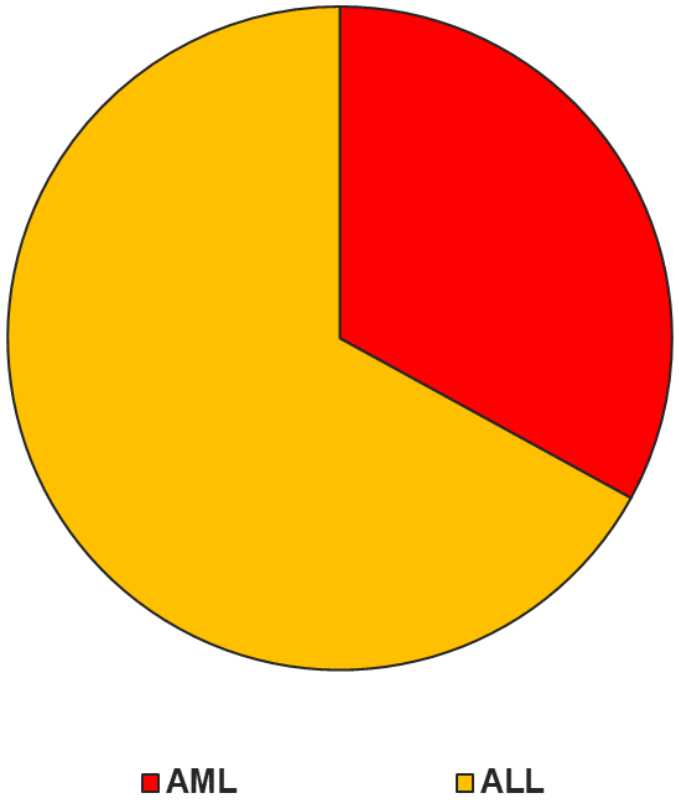
- Introduce a list of targeted leukemia therapy.
- Describe mechanism of action of targeted leukemia therapy.
- Discuss indications for targeted leukemia therapy.
- Demonstrate effectiveness of targeted leukemia therapy.
- Review side effects of targeted leukemia therapy.

Historical Background

- Leukemia: “White Blood” was described in 1845.
- Leukemia late 1800’s
  - Myeloid and Lymphoid
  - Acute and chronic
- Arsenic was used unsuccessfully as early as leukemia was recognized.

Pediatric Leukemia Epidemiology





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5 yo child with WBC of 300k

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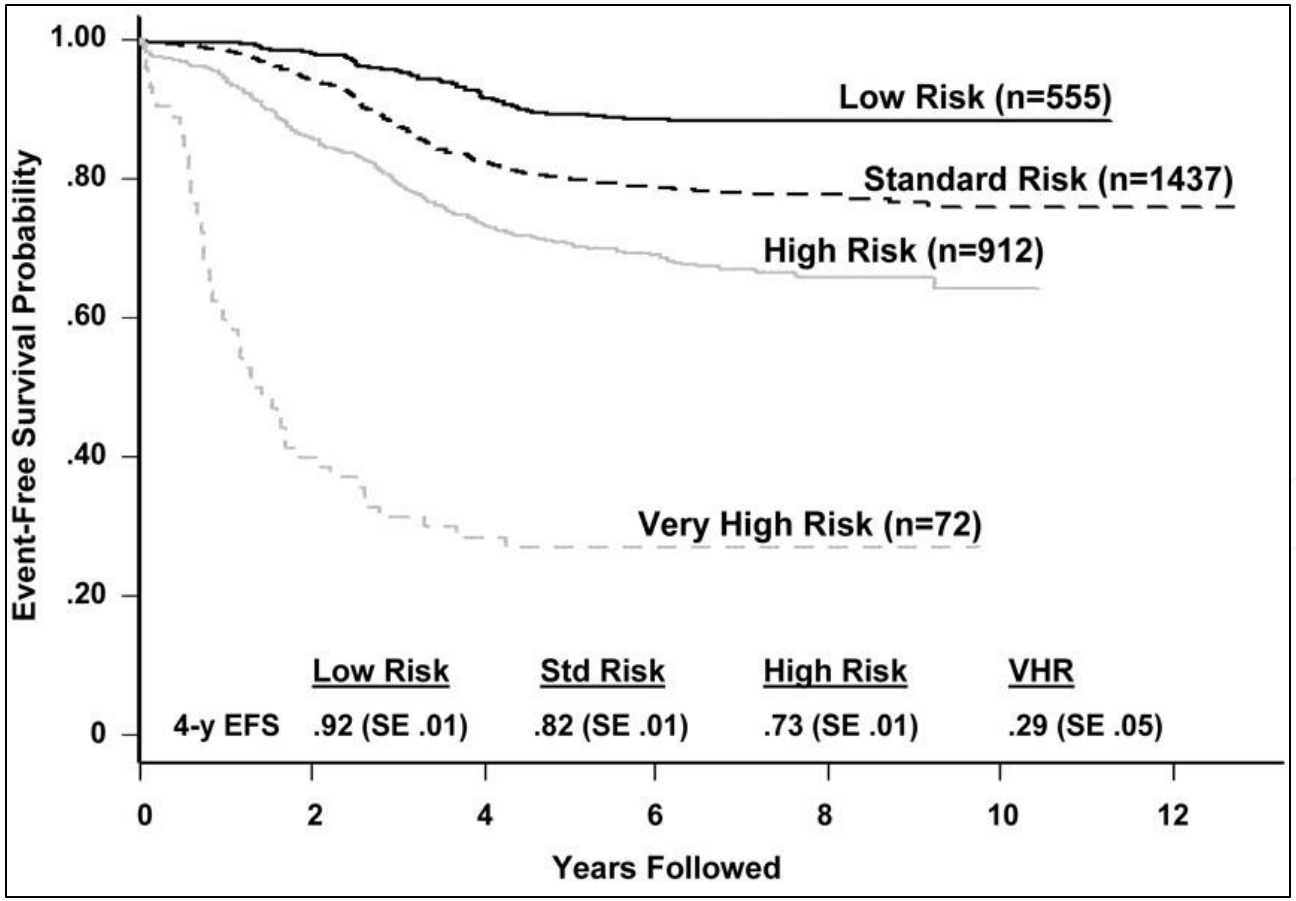
ALL: Prognosis



https://ashpublications.org/blood/article/109/3/926/23902/Risk-and-response-based-classification-of

Remission

- Morphologic 5%
- Flow Cytometry 1%
- Minimal Residual Disease (MRD) 0.1%
  - Flow
  - FISH/PCR
- Clonal Sequencing 0.001%

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CNS Leukemia

- CNS leukemia is a given
- Treatment:
  - Radiation
    - 2,400 cGy too toxic
    - 1,800 cGy as effective
    - 1,200 cGy not effective
- IT-Chemo. By 1995 CNS radiation omitted if IT

GOOD ACCURACY
GOOD PRECISION

POOR ACCURACY
GOOD PRECISION

POOR ACCURACY
POOR PRECISION

ALL: Treatment Variety

- Remission induction: 3 vs. 4 drug
- Consolidation:
- Maintenance: 6-MP and MTX
- Duration

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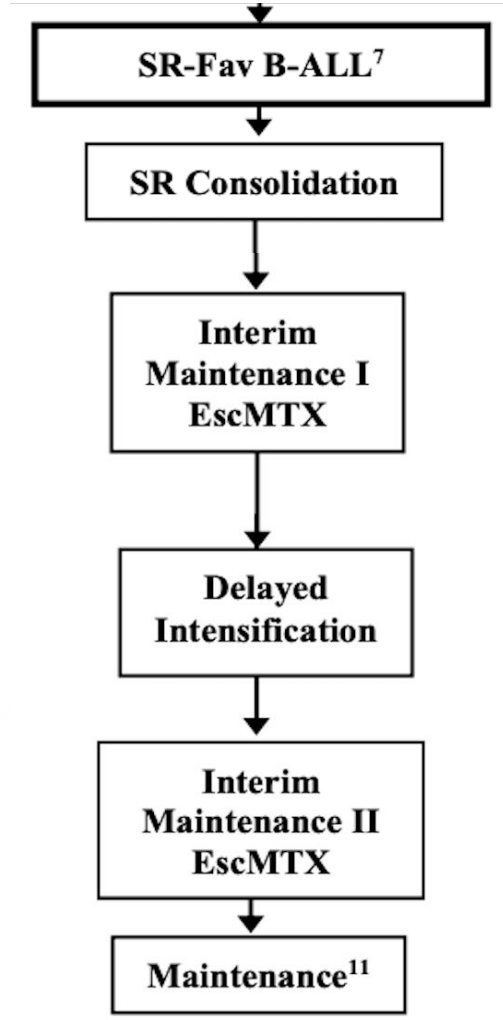
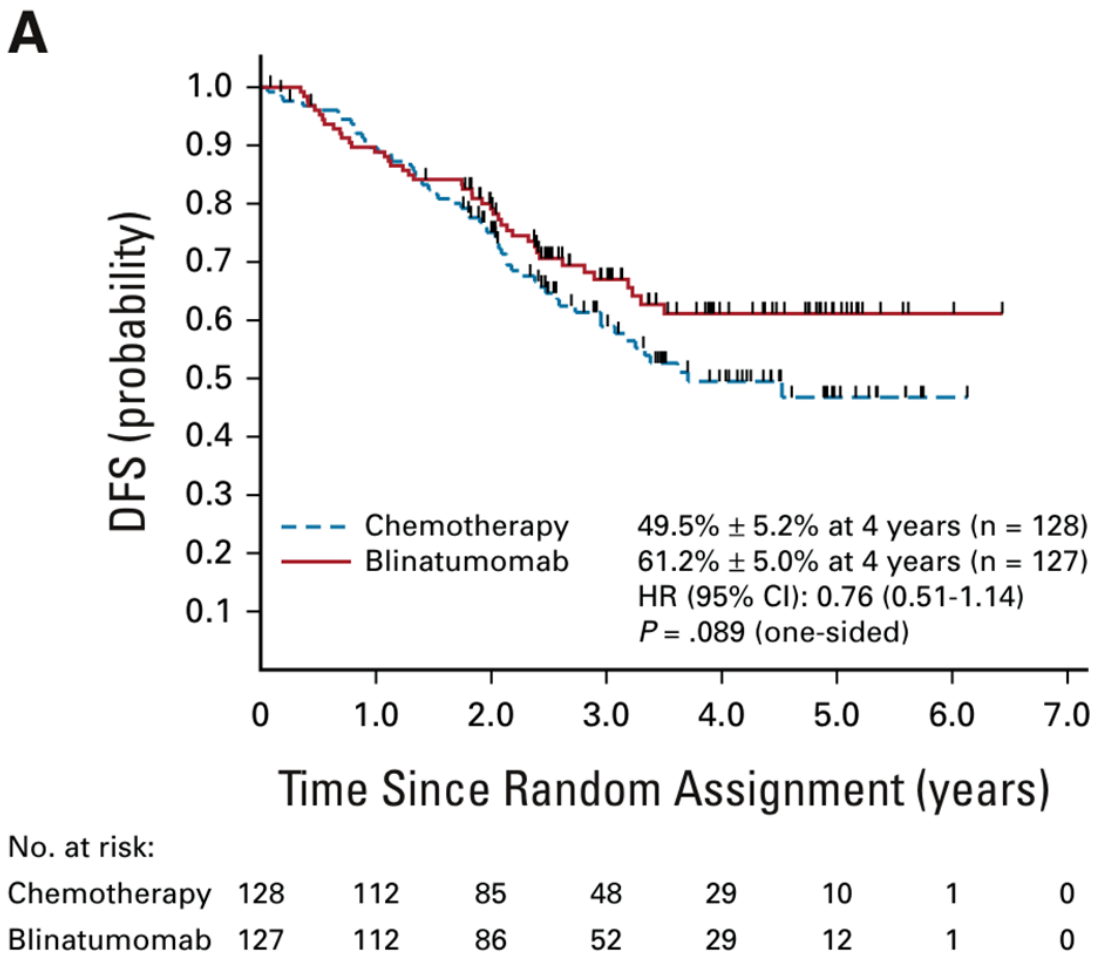

SR-Fav B-ALL[7]
SR Consolidation
Interim Maintenance I EscMTX
Delayed Intensification
Interim Maintenance II EscMTX
Maintenance[11]

Targeted Therapy

- **MOA:** Monoclonal Antibodies. Passive immunity
- **CART:** Chimeric Antigen Receptors T-Cell: temporary active Immunity
- **HSCT:** Hematopoietic Stem Cell Transplantation: permanent active Immunity
- **TKI:** Tyrosine Kinase Inhibitors

New Agents - Blinatumomab

RELAPSE



Hogan LE, et al. J Clin Oncol. 2023 Sep 1;41(25):4118-4129.

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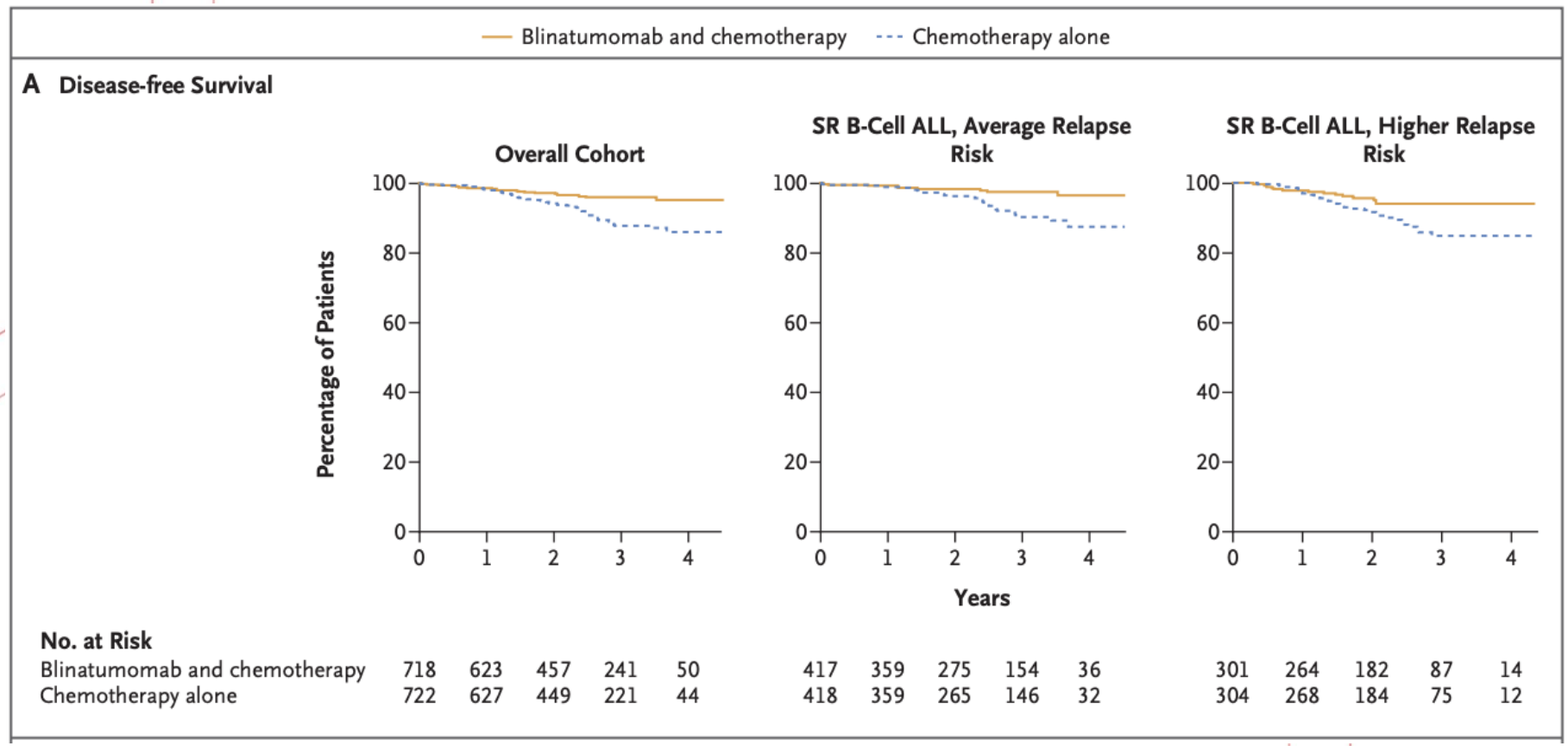
New Agents - Blinatumomab

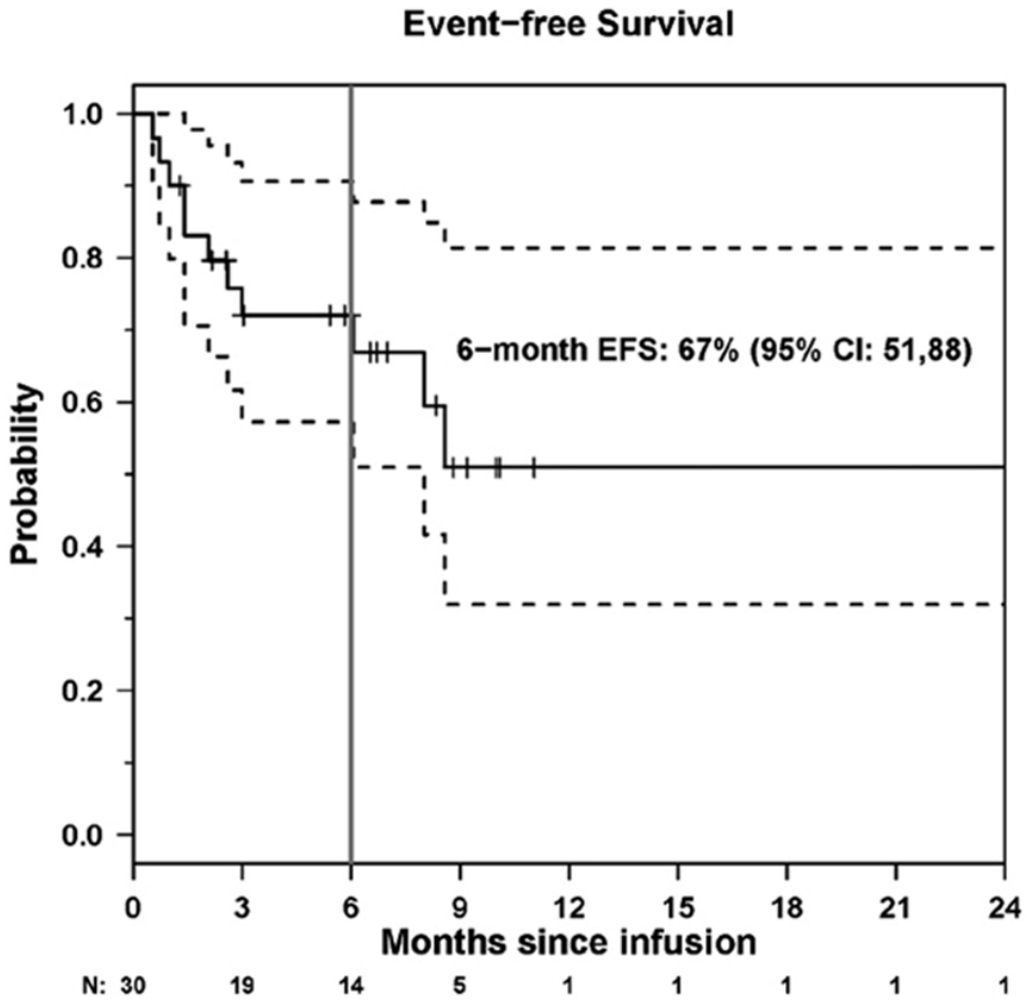
NEW



Gupta S, et al. N Engl J Med. 2025 Feb 27;392(9):875-891

New Agents - Chimeric Antigen Receptor (CAR) T-Cell

Relapse



Maude SL, et al. Blood. 2015 Jun 25;125(26):4017-23.

Venetoclax

- BCL-2 is anti apoptosis
- BCL-2 overexpression is common in pediatric ALL and AML
- Venetoclax is a highly selective, potent, oral BCL-2 inhibitor
- Venetoclax is approved for adult leukemia.
- Venetoclax has activity in preclinical and clinical leukemia.
- Venetoclax is independent of CD19 expression

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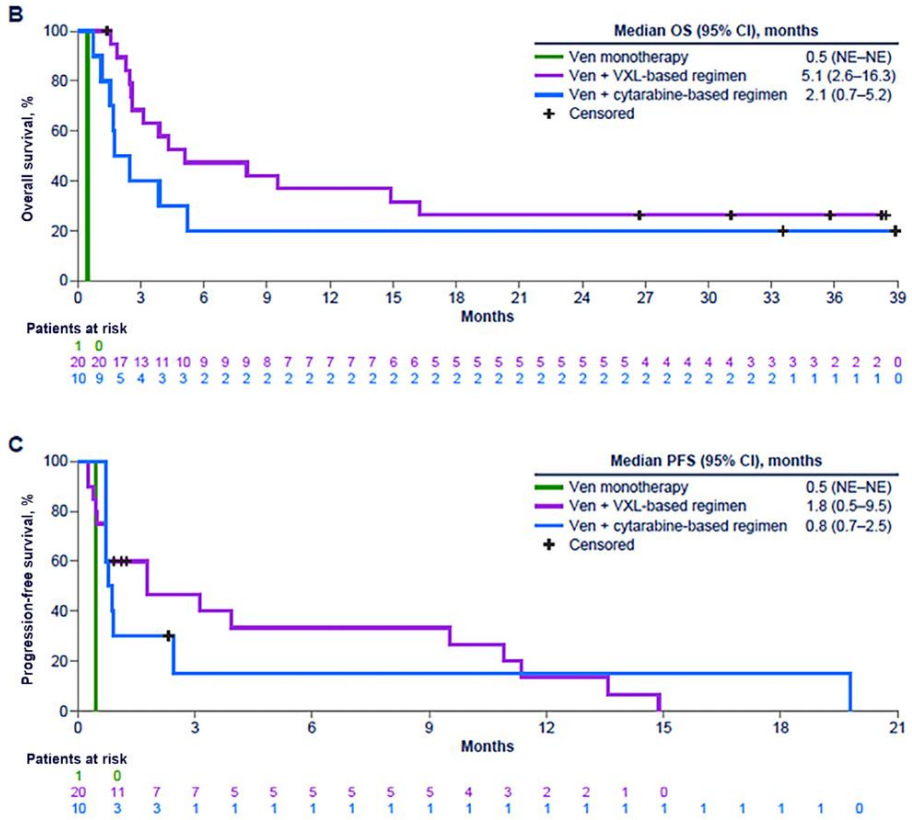
New Agents - Venetoclax



Is it worth it?

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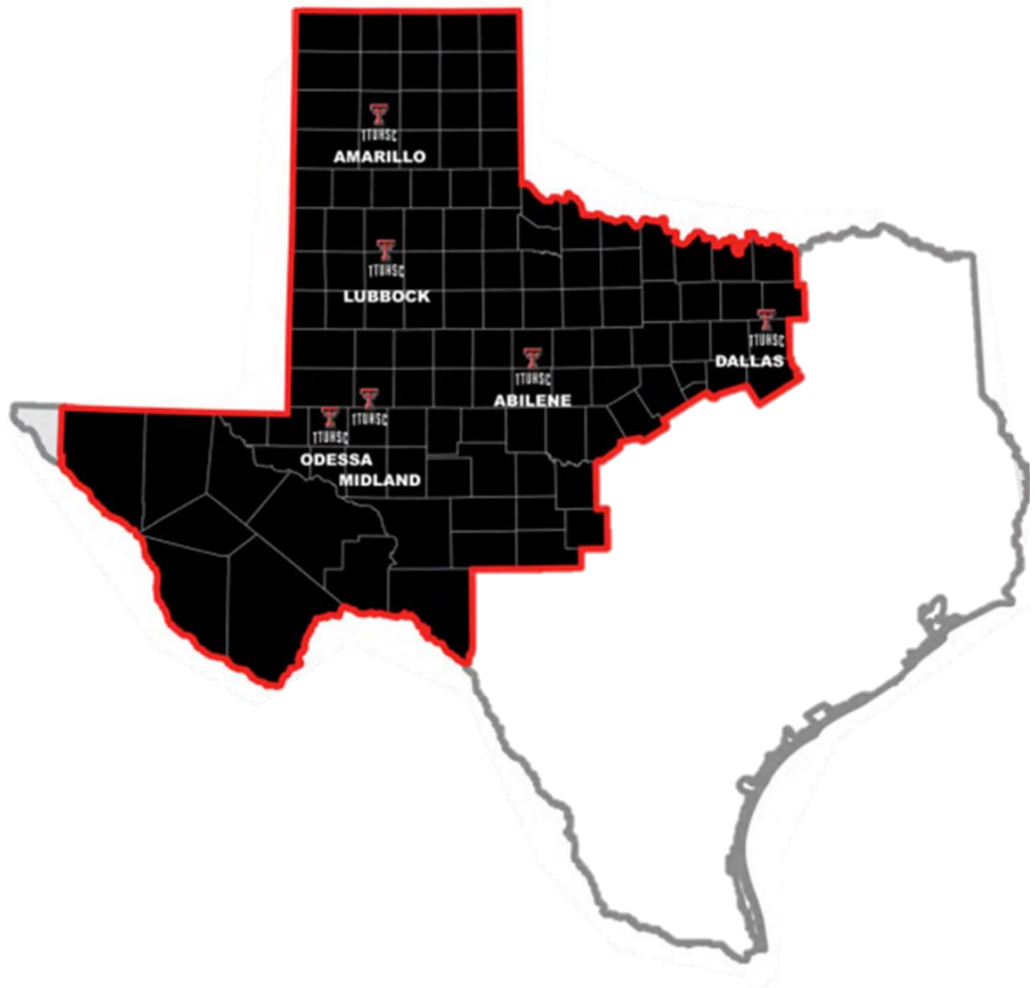
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THE FUTURE *of* CANCER CARE

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Seriously?!?!

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Outside my job