

WELCOMING REMARKS

KEY INSIGHTS: TREATING ADULT ACUTE LYMPHOBLASTIC LEUKEMIA (ALL)



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Washington, DC



PRESENTATION

KEY INSIGHTS: TREATING ADULT ACUTE LYMPHOBLASTIC LEUKEMIA (ALL)



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DISCLOSURES

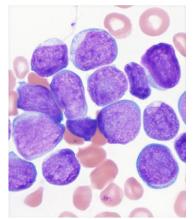
KEY INSIGHTS: TREATING ADULT ACUTE LYMPHOBLASTIC LEUKEMIA (ALL)

Marc Schwartz, MD

• Consulting/Speaker fees: Jazz, Autolus, Kite



DIAGNOSIS OF ALL



Presenting signs/symptoms:

- Elevated WBC with circulating leukemia cells (blasts)
- Pancytopenia
- Extramedullary disease (ie, mediastinal mass)

Immunophenotype (Flow cytometry, IHC)

Early precursors: CD34, TdT, CD117

Lymphoid:

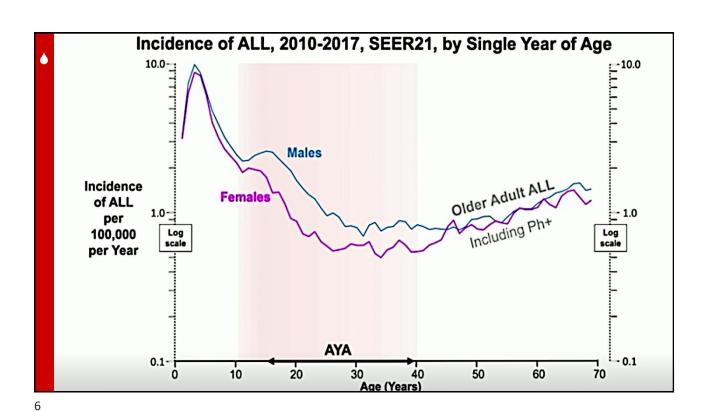
B cell: CD19, cCD22, CD79a, CD10, CD19, CD20,

sCD22, CRLF2, PAX-5

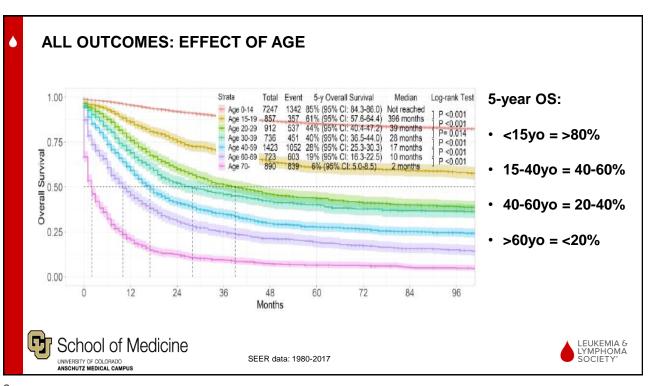
T cell: cytoplasmic CD3, CD2, CD4, CD5, CD7, CD8

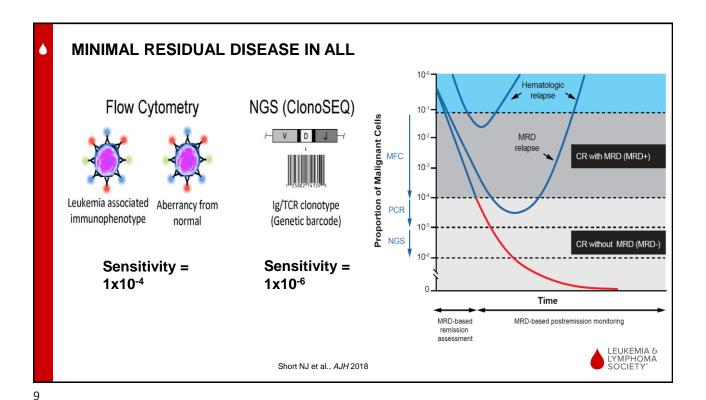






ALL GEN	L GENETICS: PEDIATRIC VERSUS ADULT							
		Pediatric	Adult					
	Incidence	Peak 1-5 vears	Nadir age 40	1				
	% of acute leukemia	80-85%	30%					
	Cases per year (US)	3,000	3,000					
	Chromosomes							
	Ph+/BCR-ABL1	3%	20-30%					
	MLL - t(4; 11)	1-2%	7%					
	TEL/AML1	20%	2%					
	Hyperdiploid	25%	5%	1				
	Ph/BCR-ABL1-like	10-15%	20-25%					
	T cell	10-15%	20-25%					
	Mature B	1-2%	3-5%	▲ LEUK				





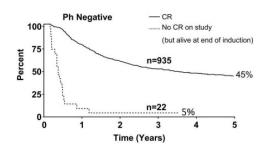
- 1) Frontline blinatumomab in Ph-negative ALL: results of ECOG 1910 study
- 2) Frontline blinatumomab in Ph-positive ALL
- 3) CAR T-cell therapy for relapsed/refractory B-ALL: Brexu-cel, Obe-cel
- 4) Future directions in adult ALL



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ECOG 2993/UKALL12



- Multi-agent chemotherapy regimen (induction/consolidation/maintenance) in adults 18-65 yo
- CR rate >90%; 5-year OS 45% in Ph-negative ALL

Goldstone, Blood 2008



PEDIATRIC-INSPIRED REGIMENS IN ADULTS WITH ALL

Table 2. Summary of prospective trial results of the pediatric regimen in adolescent and adult ALL

Trial	Description	No. evaluab	Participa age, y	t EFS, % (95% CI)	OS, % (95% CI)
CALGB 10403 ⁶	Phase 2 single-arm multicenter trial conducted by the US adult cooperative groups using a pediatric regimen based on COG AALL0232	295	17-39	3 y, 59 (54%-65%)	3 y, 73 (68%-78%)
DFCI 01-175 ²⁰	Multicenter trial conducted in the United States and Canada utilizing a pediatric- inspired regimen	92	18-50	4 y, 58 (47%-68%)	4 y, 67 (56%-76%)
GRAALL-2003 ¹⁹	Phase 2 multicenter trial conducted by the GRAALL adult cooperative group across France, Belgium, Switzerland evaluating a pediatric-inspired regimen	225	15-60	3.5 y, 55 (48%-62%)	3.5 y, 60 (53%-66%)
GRAALL-2005 ¹⁸	Multicenter successor trial of GRAALL- 2003; included a randomization to standard or hyperfractionated cyclophosphamide	787	18-59	5 y, 52.2 (48.5%-55.7%)	5 y, 58.5 (54.8%-61.9%)
PETHEMA ALL-96 ⁵⁵	Multicenter trial conducted by the Spanish adult cooperative group utilizing a common pediatric regimen in adolescents and young adults with SR ALL	81	15-30	6 y, 61 (51%-72%)	6 y, 69 (59%-79%)
MDACC ²⁴	Single-center trial conducted by MDACC evaluating an augmented BFM pediatric regimen	106	13-39	Not provided	5 y, 60%
NOPHO ALL2008 ²¹	Multicenter protocol conducted by the Nordic cooperative group evaluating a common pediatric regimen across children, adolescents, and adults	221*	18-45	5 y, 74% ± 4%†	5 y, 78% \pm 3%†

AYA/adults treated with pediatric regimens:

- EFS ~55-70%
- OS ~60-80%

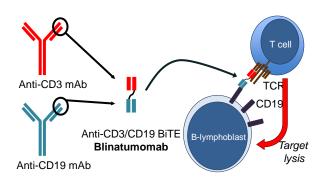


Muffly L (2019) ASH Ed



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BLINATUMOMAB



TOWER trial¹: Blina vs chemo in r/r B-ALL

- CR/CRi: 33.6% vs 15.7% (*P*<0.001)
- OS: **7.7 vs 4.0 mo**; HR=0.71, *P*=**0.01**
- ORR better with lower disease burden (<50% vs >50% BM blasts)

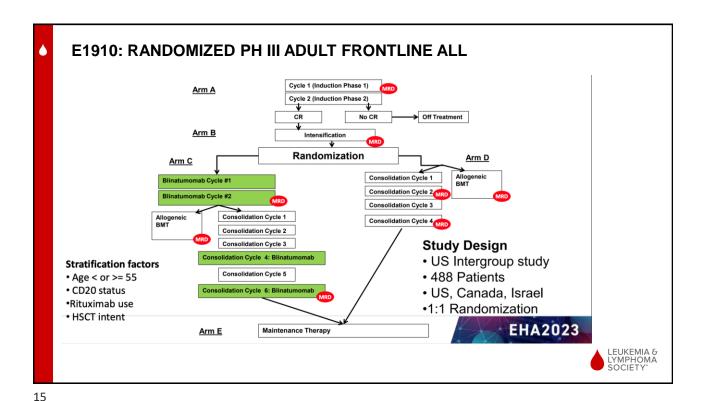
BLAST trial²: MRD+ (≥10⁻³) after chemotherapy

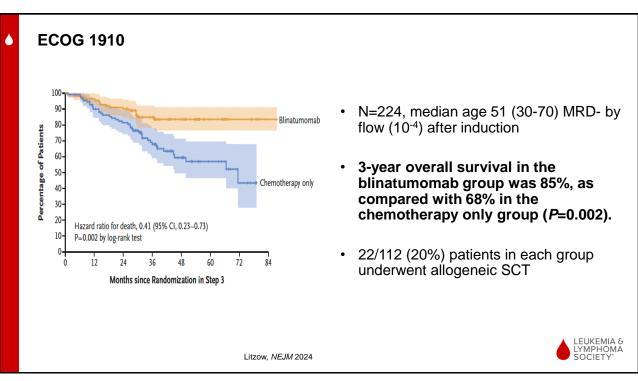
 91/103 (88%) achieved MRD-negativity (<10⁻⁴) after blina



- . Kantarjian NEJM 2017
- Gokbuget Blood 2018







INOTUZUMAB OZOGAMICIN CD22 INO-VATE: Anti-CD22 InO vs chemotherapy in r/r B-ALL mAb • CR/CRi rate: 81% vs 29% (*P*<0.001) Calicheamicin OS: 7.7 vs 6.7 mos; HR=0.77 Inotuzumab (P=0.04)ozagamicin

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School of Medicine

UNIVERSITY OF COLORADO ANSCHUTZ MEDICAL CAMPUS

NOVEL AGENTS IN FRONTLINE TREATMENT OF PH-NEGATIVE B-ALL

Kantarjian NEJM 2016

Author	Group	Trial Design	n, Age	Outcome
Litzow ¹	ECOG	MRD- (10 ⁻⁴) after IND/INT: Consolidation with chemotherapy vs chemotherapy + 4 cycles blinatumomab	N=224 Age: 30-70	3-year OS: 85% (chemo+blina) vs 63% (chemo), p=.002
Gupta ²	COG	NCI SR ALL: consolidation with chemotherapy vs chemotherapy + 2 cycles blinatumomab	N=1440 Age: 1-10	3-year DFS: 96% (chemo+blina) vs 88% (chemo), p=<.001
DeAngelo ³	Alliance	Pedi-inspired chemo with or without 2 cycles Inotuzumab after IND	N=273 Age: 18-39	3-year DFS: 69% (INO+chemo) vs 66.7% (chemo)
Jabbour ⁴	MDACC	hyperCVAD + 4 cycles blinatumomab	N=38 Age: 29-45	3-year RFS: 73%
Stelljes ⁵	GMALL	Inotuzumab (3 cycles) → consolidation chemo	>55	3-year EFS: 55%
Jabbour ⁶	MDACC	minCVD+InO +/- blinatumomab	>60	5-year PFS: 48%

- Litzow, NEJM 2024 Gupta NEJM 2025

- DeAngelo ASH 2024 Jabbour, Lancet Hemat 2022 Stelljes, JCO 2024
- Jabbour, Lancet Hemat 2025



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PH-NEGATIVE B-ALL: KEY TAKEAWAYS AND QUESTIONS

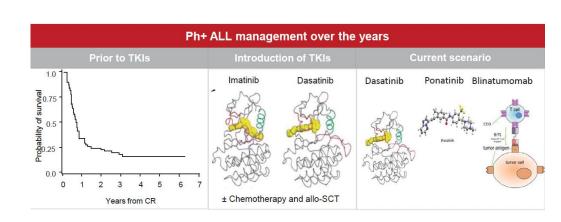
 For pediatric and adult patients achieving remission after chemotherapy, adding blinatumomab (2-4 cycles) to post-remission chemotherapy improves outcomes by reducing risk of relapse.

Questions:

- With addition of blinatumomab, can we reduce amount/intensity of chemotherapy backbone?
- Role for other novel agents (inotuzumab, CAR T, other targeted agents)?



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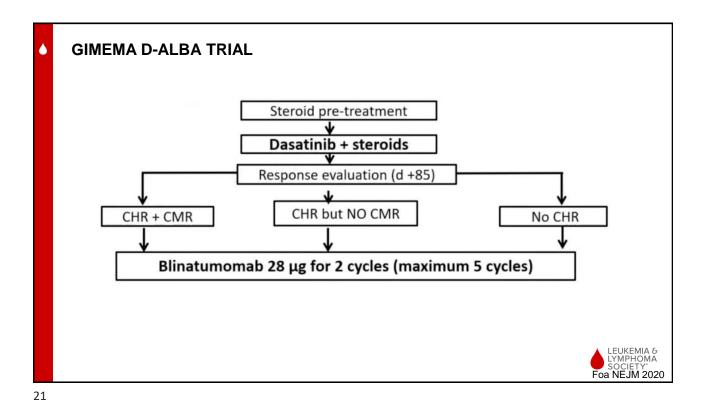


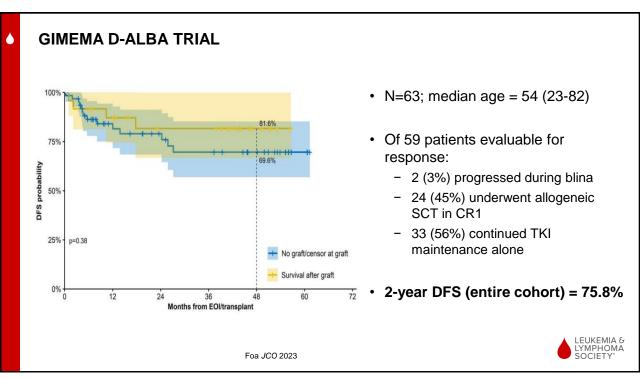
- Long-term OS with SCT: ~30-40%
- Long-term OS without SCT: <20%
- Long-term OS with SCT: ~60-70%
- Long-term OS without SCT: ~40-50%

Chiaretti, Blood Adv 2024

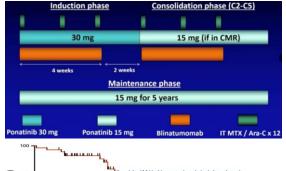


Long-term OS: ~80-90%





PONATINIB + BLINATUMOMAB (MDACC)



Time (months)

- N=60 patients, median age 60 (20-83)
- MRD-negativity by NGS (10⁻⁶) = 98%
- 3-year EFS = 77%
- 2/60 (3%) underwent allogeneic SCT in CR1



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BLINATUMOMAB PLUS TKI (CHEMO-FREE) APPROACH IN PH+ ALL:

Kantarjian JCO 2024

- TKI+blinatumomab without systemic chemotherapy results in long-term relapsefree survival in ~75% of patients
- Ponatinib + blinatumomab produces deep molecular remission in nearly all patients, which appears to be sustained in a majority (but not all) patients without allogeneic SCT

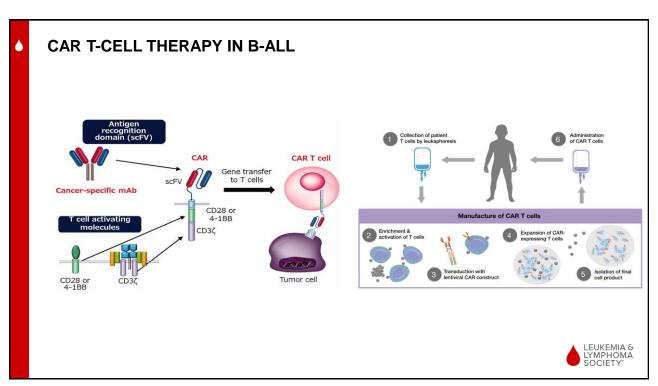
Questions:

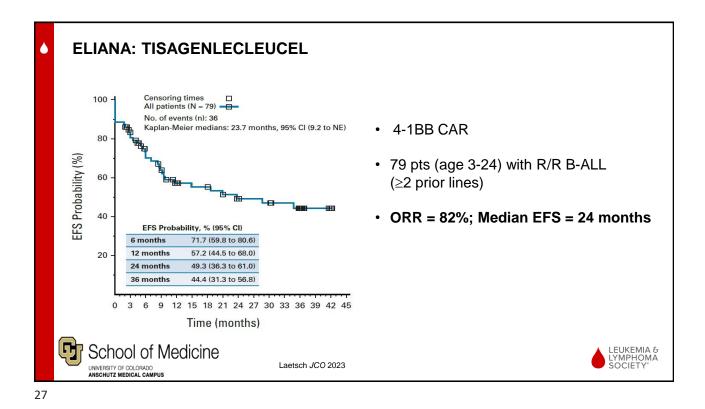
- Is there a role for systemic chemotherapy before/after blinatumomab to mitigate relapse risk? Role for CD19 CAR T in high-risk patients after blina/ponatinib?
- Question: For patients achieving sustained deep molecular remission, when can we stop TKI?

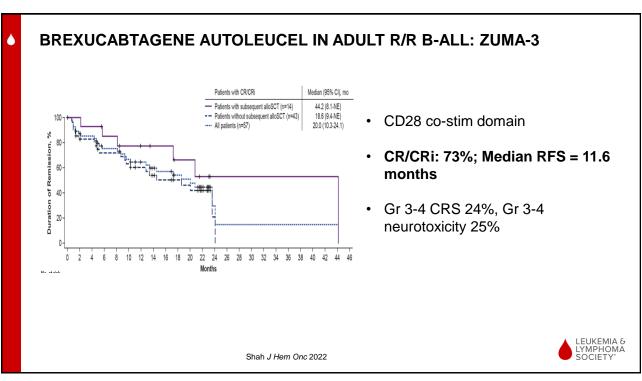


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OBECABTAGENE AUTOLEUCEL (OBE-CEL) IN ADULT R/R B-ALL: FELIX STUDY Event-free Survival According to Bone Marrow Burden before Lymphodepletion 4-1BB CAR Percentage of Patients 80 70 • N=127 (median age 47, 20-81) <5% Blasts 60 50 5%-75% Blasts • ORR=77%, Median EFS = 11.9 40months 30-20->75% Blasts • Gr 3-4 CRS 2.4%, Gr 3-4 neurotox 10 7.1% 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35

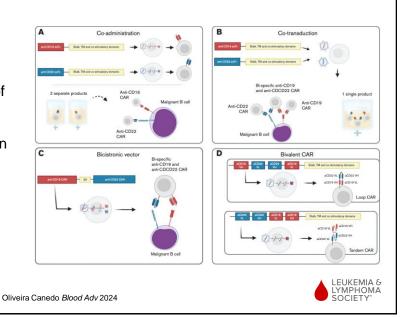
Roddie NEJM 2024

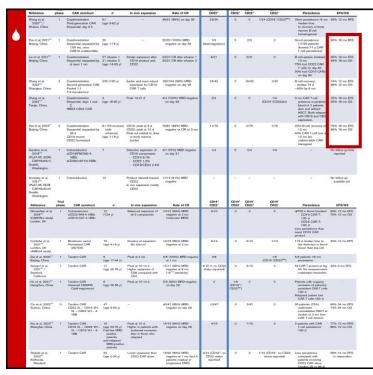
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DUAL-TARGETING CAR T CELLS (CD19/CD22)

2 mechanisms of relapse after CD19 CAR T:

- CD19+ relapse due to loss of CAR T-cell persistence
- CD19- relapse due to antigen escape





DUAL-TCD19/CD22 CAR T FOR B-ALL

- Outcomes thus far comparable with CD19 CAR T
- Majority of relapses are CD19+/CD22+, indicating lack of CAR persistence
- Co-administration appears to be most promising strategy, few trials reporting EFS >60-80% at or beyond 12 months

Oliveira Canedo Blood Adv 2024

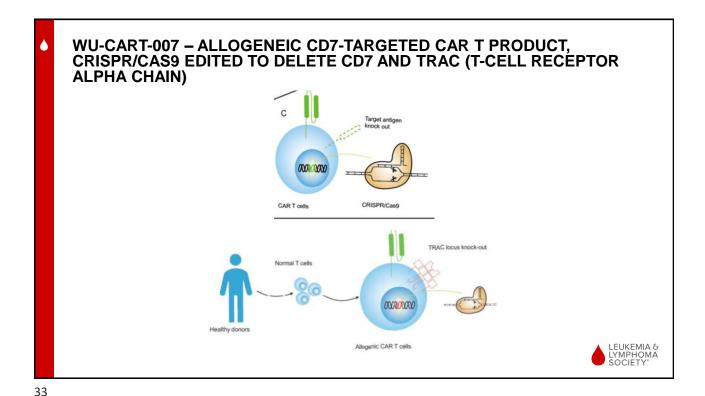


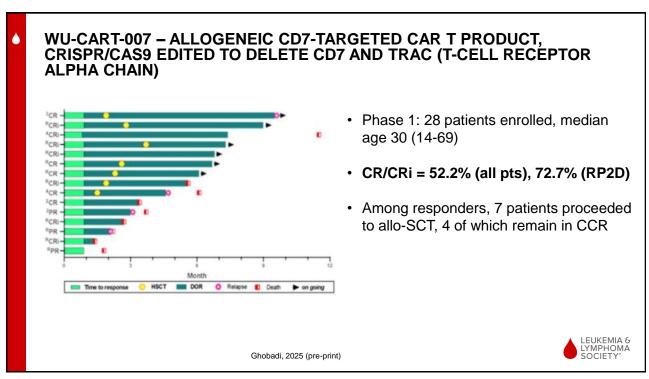
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Barriers to CAR T for T-ALL:

- Fratricide
- Product contamination by malignant T cells
- T-cell aplasia







CAR T-CELL THERAPY IN ALL

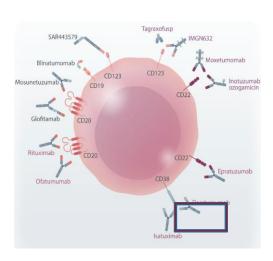
- CD19 CAR T-cell therapy leads to responses in ~70-90% of patients with relapsed/refractory B-ALL
- In adults, data from ZUMA3 and FELIX suggest comparable response rates and durability between Brexu-cel and Obe-cel, but lower rates of high-grade CRS and ICANS with Obe-cel
- Dual-targeting (CD19/22) CAR T cells for B-ALL and CD7 CAR T cells for T-ALL likely to be next major advancements in the field



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OTHER TARGETED THERAPIES IN ALL: DARATUMUMAB

Bhatla, Blood 2024



DELPHINUS study

Weekly daratumumab (anti-CD38 Mab) + chemotherapy (VXLD) in R/R T-ALL/LBL

- CR/CRi = 82.8% (n = 29)
- 21/29 patients (72.4%) bridged to allo SCT



Thank you!

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ASK A QUESTION TREATING ADULT ACUTE LYMPHOBLASTIC LEUKEMIA (ALL)

Ask a question by phone:

Press star (*) then the number 1 on your keypad.

Ask a question by web:

Click "Ask a question"
Type your question
Click "Submit"

Due to time constraints, we can only take one question per person. Once you've asked your question, the operator will transfer you back into the audience line.



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