Hope Is Here in CLL Oncology Nurse Strategies for Delivering Effective, Compassionate, and Modern Care to Patients

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Indications for Treatment of CLL Have Not Changed and Include Cytopenias, Splenomegaly, Lymphadenopathy

Any one of these criteria should be met to initiate CLL therapy (iwCLL)¹

- □ Progressive marrow failure, Hb <10 gm/dL, or PLT <100 × 10⁹/L
- □ Massive (≥6 cm below left costal margin) or progressive or symptomatic splenomegaly
- □ Massive (≥10 cm in longest diameter) or progressive or symptomatic lymphadenopathy
- □ Progressive lymphocytosis + increase of ≥50% over a 2-month period or lymphocyte doubling time of <6 months</p>
- □ Autoimmune complications of CLL that are poorly responsive to corticosteroids
- Symptomatic extranodal involvement (eg, skin, kidney, lung, and spine)
- Disease-related symptoms



Why Are We Here? Despite Progress With Targeted Therapy, CLL Still Presents an Ongoing Challenge

CIT is not a category 1 recommendation in current guidelines

 Yet in the informCLL registry, 40% of patients with unmutated IGHV received CIT, despite decreased efficacy¹

CLL patients previously treated with both a covalent BTKi and a BCL-2i experience poor outcomes with currently available options

 Median time to discontinuation of the post–BTKi/BCL-2i therapy or death was 5.5 months²

1. Mato A et al. *Clin Lymphoma Myeloma Leuk*. 2020;20:174-183. 2. Mato A et al. 63rd American Society of Hematology Annual Meeting and Exposition (ASH 2021). Abstract 3743.



Upfront Choices: Continuous vs Time-Limited Therapy (1)

Nurse Consult 1: Assessing Next Steps for a Patient With High-Risk, Symptomatic CLL

Michael was 72 years old when he was diagnosed with asymptomatic CLL; now 74, he returns to clinic with symptomatic disease, including

- Classic B symptoms, anemia, and abdominal adenopathy
- Comorbid HTN
- CrCl >60 mL/min

Testing shows

- Unmutated IGHV
- TP53 mutation

What are the next steps?

How should Michael be counseled on his disease and prognosis?

Continuous or fixed-duration therapy?

Explain the Modern Goals of Therapy to Patients With CLL

- Modern therapy is very effective but can achieve different goals
- Be prepared to review goals of care with patients and empower their decision-making

• BTK inhibitors

Goal of Therapy

- Disease control
- Prolonged PFS
- Independent from response, MRD

Fixed Duration

 Venetoclax + obinutuzumab Goal of Therapy

- Disease eradication
- Prolonged PFS
- Undetectable MRD

BTK and BCL-2 Inhibitors Are the Preferred Upfront Treatment Options in TN CLL...¹

Patients aged ≥65 y OR

Patients aged <65 y with significant comorbidities (CrCl <70 mL/min)

Preferred regimens

- Acalabrutinib ± obinutuzumab (category 1)
- Ibrutinib (category 1)
- Venetoclax + obinutuzumab (category 1)
- Zanubrutinib

Preferred regimens

Patients aged <65 y without significant comorbidities Acalabrutinib ± obinutuzumab (category 1)

- Ibrutinib (category 1)
- Venetoclax + obinutuzumab (category 1)
- Zanubrutinib

... Including in High-Risk Settings¹

NCCN-Suggested Regimens for CLL With del(17p)/TP53 Mutations

	First-Line Therapy				
Preferred Regimens Other Recommended Regime					
•	Acalabrutinib ± obinutuzumab	Alemtuzumab ± rituximab			
•	Ibrutinib	 HDMP + rituximab 			
•	Venetoclax + obinutuzumab	 Obinutuzumab 			
•	Zanubrutinib				

Chemoimmunotherapy is NOT recommended

Consistent PFS Benefit Across Pivotal 1L Studies Comparing Novel Agents With CIT

Study	Population	Design	PFS Benefit for Experimental Arm?
E1912 ¹	"Fit," no del(17p)	FCR x 6 vs IR x 6, then ibrutinib maintenance	Yes
ALLIANCE ²	"Fit," older, del(17p) allowed	3 arm: BR vs IR vs I	Yes
iLLUMINATE ³	Unfit (CIRS >6 or CrCl <70) or <i>TP53</i> del/mut	G + Cbl vs G + ibrutinib	Yes
ELEVATE-TN ⁴	Unfit (CIRS >6 or CrCl <70)	G + Cbl vs acalabrutinib vs G + acalabrutinib	Yes
SEQUOIA ⁵	Older, no del(17p)	BR vs zanubrutinib	Yes
CLL14 ⁶	Unfit (CIRS >6 or CrCl <70)	G + Cbl vs venG	Yes

Continuous therapy Fixed duration

1. Shanafelt TD et al. *N Engl J Med.* 2019;381:432-443. 2. Woyach JA et al. *N Engl J Med.* 2018;379:2517-2528. 3. Moreno C et al. *Lancet Oncol.* 2019;20:43-56. 4. Sharman JP et al. *Lancet.* 2020;395:1278-1291. 5. Tam C et al. ASH 2021. Abstract 396. 6. Fischer K et al. *N Engl J Med.* 2019;380:2225-2236.



Longer-Term Evidence Supports Continuous BTKi Therapy...

RESONATE-2	Ibrutinib versus chlorambucil in TN CLL	Take-home: sustained
8 years of follow-up ¹	 PFS benefit with ibrutinib 59% versus 9% at 7 years Benefit in del(11q) and unmutated IGHV patients OS at 7 years was 78% with ibrutinib 	benefit with first-line ibrutinib treatment for CLL, including for patients with high-risk genomic features

Longer-Term Evidence Supports Continuous BTKi Therapy... (Cont'd)

ELEVATE-TN ¹	Acalabrutinib versus acalabrutinib + obinutuzumab versus O-Clb	Take-home: sustained	
4 years of follow-up	 PFS benefit with acalabrutinib NR versus 27.8 months 81% lower risk for disease progression or death with acalabrutinib alone versus O-Clb 	benefit with use of acalabrutinib regimens versus O-Clb combination in TN CLL	



... Including in TP53 CLL Subgroups

Study	Population	Design	Patients With <i>TP53</i> , n	PFS in <i>TP53</i> Subgroups
ALLIANCE ¹	Fit, older, del(17p) allowed	3 arms: BR vs IR vs I	51	Median not established for I or IR vs 7 mo for BR
iLLUMINATE ²	Unfit (CIRS >6 or CrCl <70) or <i>TP53</i> del/mut	G + Cbl vs G + ibrutinib	29	Median not reached for I + G vs 11.3 mo for G + Cbl
ELEVATE-TN ³	Unfit (CIRS >6 or CrCl <70)	G + Cbl vs acalabrutinib vs G + acalabrutinib	61	24-mo PFS: 95% for acalabrutinib + G vs 19% for G + Cbl

What About Fixed-Duration Venetoclax + Obinutuzumab in *TP53* CLL?

Although fixed-duration venG was effective in the CLL14 trial, the presence of del(17p)/*TP53* was associated with an unfavorable prognosis¹



Explain Prognostic Factors to Patients

Counsel patients on adverse risk factors



Use tools to help patients understand implications for treatment

Mutata di aval/avi da lata d
Mutated and/or deleted
Unmutated
>3.5
Binet B/C or Rai I-IV
>65 years

CLL Society Toolkit: Test Before Treat[™] Campaign

Test Before Treat [™]	 Test FISH and TP53 Mutation before every treatment Test IgVH mutation status before the 1st treatment Deletion 17p or del(17p) = NO CHEMOTHERAPY TP53 mutation = NO CHEMOTHERAPY IgVH unmutated = NO FCR IgVH mutated = possible FCR
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Nurse Consult 1: Recommendations for Michael

Recommendations

- Counsel Michael on his expected prognosis using appropriate tools and resources
- Educate on the risks and benefits of continuous versus fixed-duration therapy
- Continuous BTKi therapy is an excellent choice for this patient
- Fixed-duration venG is also reasonable assuming different patient preferences and goals of therapy

Michael was 72 years old when he was diagnosed with asymptomatic CLL; now 74, he returns to clinic with symptomatic disease, including

- Classic B symptoms, anemia, and abdominal adenopathy
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- CrCl >60 mL/min

Testing shows

- Unmutated IGHV
- TP53 mutation

What are the next steps? How should Michael be counseled on his disease and prognosis?

Continuous or fixedduration therapy?



Nurse Consult: Assuming Michael Is Preparing for Therapy With a BTKi, What Next?

Recommendations

- Counsel Michael on his expected prognosis using appropriate tools and resources
- Educate on the risks and benefits of continuous versus fixed-duration therapy
- Continuous BTKi therapy is an excellent choice for this patient
- Fixed-duration venG is also reasonable assuming different patient preferences and goals of therapy
- Assuming BTKi therapy is chosen, next steps should include counseling on dosing and drug interactions

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What are the next steps? How should Michael be counseled on his disease and prognosis?

Continuous or fixedduration therapy?

Ibrutinib Dosing and Administration¹

Dosing for CLL Differs From MCL

• CLL

- 420 mg by mouth once daily (as a single agent or combined with BR or obinutuzumab)
- Administer ibrutinib **before** rituximab or obinutuzumab when given on the same day
- MCL
 - 560 mg by mouth once daily

Administration

- · Administer at approximately the same time each day with a full glass of water
- If administered with CYP3A inhibitors, consult prescribing information for dose modifications

Additional Practice Notes

 Reduce dosage to 140 mg once daily for mild hepatic impairment and to 70 mg once daily for moderate hepatic impairment

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1. Imbruvica (ibrutinib) Prescribing Information. https://www.accessdata.fda.gov/drugsatfda_docs/label/2018/210563s000lbl.pdf.

Acalabrutinib Dosing and Administration¹

Approved Dosing in MCL and CLL

• 100 mg by mouth every 12 hours (twice daily)

Administration

- Administer with a full glass of water with or without food
- If a dose is missed by more than 3 hours, it should be skipped and the next dose should be taken on the regular schedule

Additional Practice Notes

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 Dosage adjustments are recommended when used concomitantly with certain medications (eg, CYP3A inducers and PPIs)

1. Calquence (acalabrutinib) Prescribing Information. https://www.accessdata.fda.gov/drugsatfda_docs/label/2017/210259s000lbl.pdf.

Be Prepared to Review Drug Interactions With BTK Inhibitors When Counseling Patients

Coadministration of BTK inhibitors with¹

	Strong CYP3A4 Inhibitors	Moderate CYP3A4 Inhibitors	Moderate or Strong CYP3A4 Inducers	P-gp Inhibitors	Gastric Acid– Reducing Agents
lbrutinib	 If necessary, reduce to 140 mg once daily For short-term use (≤7 d), interrupt ibrutinib 	280 mg once daily	Avoid use	No dosage adjustment recommended	No dosage adjustment recommended
Acalabrutinib	Avoid use	100 mg once daily	Avoid use; if necessary, increase to 200 mg twice daily	No dosage adjustment recommended	Avoid PPIs; may decrease AUC by 43%
Zanubrutinib	80 mg once daily	80 mg twice daily	Avoid use	No dosage adjustment recommended	No dosage adjustment recommended

New acalabrutinib maleate salt: immediate-release film-coated tablet and suspension²

Clinical effect is expected to be comparable with acalabrutinib capsules at approved dosing, regardless of use of PPIs and ingestion of food

PeerView.com

1. Weis TM et al. J Oncol Pharm Pract. 2022;10781552221090869. 2. Sharma S et al. ASH 2021. Abstract 4365.

Nurse Consult: An Alternate Scenario in TN CLL

- What if Michael had presented with a history of cardiac complications/AF or poorly controlled HTN?
- Assuming continuous therapy was still preferred, can understanding BTKi safety help us refine our patient care?

Michael was 72 years old when he was diagnosed with asymptomatic CLL; now 74, he returns to clinic with symptomatic disease, including

- Classic B symptoms, anemia, and abdominal adenopathy
- Comorbid HTN
- CrCl >60 mL/min

Testing shows

- Unmutated IGHV
- TP53 mutation

What are the next steps? How should Michael be counseled on his disease and prognosis?

Continuous or fixedduration therapy?



Overview of BTK Inhibitor Toxicities in CLL¹



1. Lipsky A, Lamanna N. Hematology Am Soc Hematol Educ Program. 2020;1:336-345.

Additional Important Toxicities



Dermatologic changes



Fatigue



Ventricular arrhythmia



Cytopenias

General BTK Inhibitor Safety Monitoring Approaches¹

- Don't give concomitantly with warfarin
- New-onset AF: consider nonwarfarin anticoagulation and monitor
- Monitor for and manage cardiac arrhythmia/AF and treat appropriately
- Hypertension: manage with antihypertensives
- Monitor patients for signs of bleeding

- Arthralgia: rule out other causes, monitor, and use supportive care for lower-grade events
 - Dose reduce once symptoms affect ADLs and hold dose for higher-grade arthralgia
- Monitor for infections and secondary malignancies

- ✓ Assess CBCs monthly
- ✓ Understand risk factors for AF: age >65 years, male sex, diabetes, hypertension, and prior history

1. NCCN Clinical Practice Guidelines in Oncology. Chronic Lymphocytic Leukemia/Small Lymphocytic Lymphoma. Version 2.2022. https://www.nccn.org/professionals/physician_gls/pdf/cll.pdf.

Guidance on AEs More Typically Associated With Second-Generation BTKi¹

- Headaches commonly occur early in therapy
 with acalabrutinib
 - Typically resolve in 1-2 months
 - Manage with acetaminophen + caffeine
 - Dosage reductions/interruptions are not required

Example: in a patient experiencing headaches during the first several weeks of therapy, recommend appropriate caffeine consumption and acetaminophen as needed

• With zanubrutinib (not yet approved), be prepared to monitor for **neutropenia**

1. NCCN Clinical Practice Guidelines in Oncology. Chronic Lymphocytic Leukemia/Small Lymphocytic Lymphoma. Version 2.2022. https://www.nccn.org/professionals/physician_gls/pdf/cll.pdf.



What Are the Implications of Covalent and Noncovalent BTKi Selectivity for Off-Target Effects?



which contribute to more toxicity compared with more selective agents²

Potential off-target effects include:



PeerView.com

1. Kaptein A et al. ASH 2018. Abstract 1871. 2. Bose P et al. *Expert Opin Drug Metab Toxicol*. 2016;12:1381-1392.

Communication Is Key: Educate Patients on Safety Differences Between BTKi Options

- In head-to-head trials in CLL, more selective secondgeneration BTKi were associated with less AF
- Discuss the risks and benefits of continuous BTKi therapy with patients

	ELEVATE R/R ¹		
-	Acalabrutinib (n = 266), n (%)	lbrutinib (n = 263), n (%)	
AF/flutter (any grade)	25 (9.4)	42 (16.0)	
	ALPINE ²		
	Zanubrutinib (n = 204), n (%)	lbrutinib (n = 207), n (%)	
AF/flutter (any grade)	5 (2.5)	21 (10.1)	

Upfront Choices: Continuous vs Time-Limited Therapy (2)

Nurse Consult 2: Assessing Next Steps for a Patient With Symptomatic, Good-Prognosis CLL

Sarah is 73 years old with a recent diagnosis of symptomatic TN CLL

- Classic B symptoms, worsening lymphadenopathy
- No major comorbid illnesses
- CrCl >60 mL/min

Testing shows

- Mutated IGHV
- No TP53 mutation/del(17p)

What are the next steps?

How should Sarah be counseled on her disease and prognosis?

Continuous or fixed-duration therapy?

Goals of Therapy May Change Based on the Type of Patient

- Modern therapy is very effective but can achieve different goals
- Be prepared to review goals of care with patients and empower their decision-making



Assess Barriers When Considering Time-Limited Therapy: Key Questions to Ask

Increased risk for tumor lysis with venetoclax/obinutuzumab

Can the patient stay adequately hydrated? 1.5-2 L daily?

Ramp-up dosing with venetoclax

Are they compliant with medications?

Frequent, long clinic visits are required for multiple labs and IV hydration

• Does the patient have transportation to and from clinic?

Potential for infusion reactions with obinutuzumab

• Do they have support at home?



Consistent PFS Benefit Across Pivotal 1L Studies Comparing Novel Agents With CIT

Study	Population	Design	PFS Benefit for Experimental Arm?
E1912 ¹	"Fit," no del(17p)	FCR x 6 vs IR x 6, then ibrutinib maintenance	Yes
ALLIANCE ²	"Fit," older, del(17p) allowed	3 arm: BR vs IR vs I	Yes
iLLUMINATE ³	Unfit (CIRS >6 or CrCl <70) or <i>TP53</i> del/mut	G + Cbl vs G + ibrutinib	Yes
ELEVATE-TN ⁴	Unfit (CIRS >6 or CrCl <70)	G + Cbl vs acalabrutinib vs G + acalabrutinib	Yes
SEQUOIA ⁵	Older, no del(17p)	BR vs zanubrutinib	Yes
CLL14 ⁶	Unfit (CIRS >6 or CrCl <70)	G + Cbl vs VenG	Yes

Continuous therapy Fixed duration

1. Shanafelt TD et al. *N Engl J Med.* 2019;381:432-443. 2. Woyach JA et al. *N Engl J Med.* 2018;379:2517-2528. 3. Moreno C et al. *Lancet Oncol.* 2019;20:43-56. 4. Sharman JP et al. *Lancet.* 2020;395:1278-1291. 5. Tam C et al. ASH 2021. Abstract 396. 6. Fischer K et al. *N Engl J Med.* 2019;380:2225-2236.



Understand the Efficacy: What If Achieving Disease Eradication Is the Goal of Therapy for Your Patient?

In general, MRD rates have been lower with continuous BTKi therapy, despite excellent overall efficacy

 Multiple ways to measure MRD; examples include flow and NGS

ALLIANCE 202 Trial¹

BM uMRD at cycle 9 response evaluation

> BR Ibrutinib-Containing Regimens

iLLUMINATE Trial²

MRD response (PB + BM) at 1 year



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Patients, %

0

Understand the Efficacy: What If Achieving Disease Eradication Is the Goal of Therapy for Your Patient? (Cont'd)

uMRD (<10⁻⁴) by ASO-PCR 3 mo After EOT^{1,a}



^a Comparison done by Cochran-Mantel-Haenszel tests stratified by Binet stage and geographic region.
1. Fischer K et al. N Engl J Med. 2019;380:2225-2236.
2. Al-Sawaf O et al. Lancet Oncol. 2020;21:1188-1200.


Mutated IGHV Confers a Favorable Prognosis in CLL¹



1. Hamblin TJ et al. Blood. 1999:94:1848-1854.

Nurse Consult 2: Recommendations for Sarah

Recommendations

- Counsel Sarah on her expected prognosis using appropriate tools and resources
- ✓ Educate on the risks and benefits of continuous versus fixed-duration therapy
- ✓ Given her circumstances, fixed-duration venG is likely a reasonable option

Sarah is 73 years old with a recent diagnosis of symptomatic TN CLL

- Classic B symptoms, worsening lymphadenopathy
- No major comorbid illnesses
- CrCl >60 mL/min

Testing shows

- Mutated IGHV
- No TP53 mutation/del(17p)

What are the next steps?

How should Sarah be counseled on her disease and prognosis?

> Continuous or fixedduration therapy?

Nurse Consult 2: Recommendations for Sarah

Recommendations

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What are the next steps?

How should Sarah be counseled on her disease and prognosis?

> Continuous or fixedduration therapy?

What are the dosing and safety considerations to address?

Venetoclax Dosing and Administration Clearly Explain the Ramp-Up Dosing Schedule¹



When used with obinutuzumab: initiate venetoclax (according to the 5-week ramp-up dosing) cycle 1, day 22

When used with rituximab: start rituximab after the patient has completed venetoclax 5-week ramp-up dosing and the patient has received 400 mg once daily for 7 days

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1. Venclexta (venetoclax) Prescribing Information. https://www.accessdata.fda.gov/drugsatfda_docs/label/2019/208573s013lbl.pdf.

Monitor for Drug–Drug Interactions: Be Prepared to Modify Venetoclax Dosing¹

Agent	Venetoclax Dosing Modifications
Moderate CYP3A4 inhibitors	Reduce dose by 50%
Strong CYP3A4 inhibitors	Reduce dose by 75%
CYP3A4 inducers	Avoid concomitant administration; consider switching to alternative agents



TLS With Venetoclax in CLL^{1,2}



- Encourage patients to limit foods/fluids containing potassium and phosphorus
- Encourage oral intake of fluids

Watch for hyperuricemia symptoms

Nausea and vomiting

Shortness of breath

Irregular heartbeat

Clouding of urine

Lethargy

Joint discomfort



1. Maloney K, Denno M. *Clin J Oncol Nurs*. 2011;15:601-603. 2. Venclexta (venetoclax) Prescribing Information. https://www.accessdata.fda.gov/drugsatfda_docs/label/2019/208573s013lbl.pdf.

Assuming Our Patient Receives Venetoclax, What Would a TLS Monitoring/Prevention Plan Look Like?¹



Prevention of TLS: prophylactic hydration and antihyperuricemic agents (eg, allopurinol)² prior to first dose of venetoclax, then continue through ramp-up phase

1. Venclexta (venetoclax) Prescribing Information. https://www.accessdata.fda.gov/drugsatfda_docs/label/2019/208573s013lbl.pdf. 2. Cairo M et al. *Br J Haematol*. 2010;149:578-586.

What Are the Current Recommendations for Hydration and Dosing of Antihyperuricemics?

Hydration

• Low risk: normal hydration (1.5 to 2 L daily)

- Intermediate risk: increased hydration (3 L daily)
- High risk: increased hydration (3 L daily to 1.5 to 2 L hourly, as tolerated)

Allopurinol^{1,2}

- 200 to 400 mg/m² daily
- Dosage should be adjusted based on renal function

Rasburicase^{3,4}

- 0.2 mg/kg as a 30-minute IV infusion daily for up to 5 days
- 3 or 6 mg flat doses are useful in clinical practice
- No dosage adjustments required based on renal function
- Dosing beyond 5 days or administration of ≥1 course not recommended

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 Baldini S et al. *Blood.* 2014;124:5979.
 Aloprim (allopurinol sodium) Prescribing Information. https://www.accessdata.fda.gov/drugsatfda_docs/label/2000/020298Orig1s001.pdf.
 Trifilio SM et al. *Bone Marrow Transplant.* 2011;46:800-805.
 Elitek (rasburicase) Prescribing Information. https://www.accessdata.fda.gov/drugsatfda_docs/label/2009/103946s5083lbl.pdf.

Venetoclax: Other AEs of Interest

- Myelosuppression: manage with dose interruption/reduction
 - For grade ≥3 neutropenia, consider G-CSF and/or antibiotics
- GI events (diarrhea/nausea)^{1,2}
- Infection (upper respiratory most common)^{1,2}
- Autoimmune hemolytic anemia in 7% with monotherapy¹

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• Joint pain (12%)

Free CLL Society Patient Education Toolkit Binder for Healthcare Providers

- CLL Society is pleased to offer this CLL/SLL Patient Education Toolkit to nurses, which provides valuable handouts across a variety of topics that you can share with patients
- Can be used to explain efficacy and safety information
- Learn more and order at: https://cllsociety.org/patient-educationtoolkit/

Includes information on targeted agent classes for use in CLL

Brief Overview of Types of Treatment

Active or Disease-modifying Treatments

Treatments that aim to control, reduce, or even cure the CLL.

Targeted Therapy: Certain complex drugs that attack specific targets or pathways in cancer cells to avoid harming normal cells. Examples of targeted therapies are:

- BCL-2 Inhibitor: CLL cells are extremely dependent on BCL-2 to stay alive, much more so than normal cells. The BCL-2 inhibitor venetoclax blocks BCL-2 from preventing cell suicide. This can lead to very rapid "programmed cell death". Venetoclax is one of the newest approved CLL drugs.
- CAR-T: Chimeric antigen receptor T cells therapy is an experimental cellular therapy that programs one's immune system, specifically genetically modified T cells, a type of lymphocyte engineered to attack CLL cells. Currently CAR-T is in clinical trials for CLL.
- Monoclonal antibody (mAb): A protein called an antibody is developed to attach to specific marker on CLL cells. This helps the immune system "see" the cancer cells so it can attack them. This medication does not affect most healthy cells but can deplete normal lymphocytes with similar markers to the CLL. There are many kinds of mAbs. The CLL approved monoclonal antibodies are rituximab, obinutuzumab, ofatumumab, and alemtuzumab. Others are being studied in clinical trials. This also may be called biological or immunotherapy.
- Signal Pathway Blockers: CLL cells strongly depend on signals received through the BCR (B-cell receptor) for many vital activities and ultimately their survival. Targeted therapies such as ibrutinib, idelalisib, duvelisib, and acalabrutinib can block this signaling at different steps along its pathway, often resulting in a profound effect on the cancer while sparing normal cells. These "small molecule" medications can be taken orally.
- Tyrosine Kinase Inhibitors (TKI): These medications block the action of enzymes called tyrosine kinases (TK). TK play a critical role in cell signaling, growth, and division.
 Some TK are overexpressed in CLL and blocking them helps control CLL. Examples of these drugs include the signal blockers such as ibrutinib, idelalisib, duvelisib and several that are in development.



Delivering Optimized Sequential and Combination Therapy and Next Steps for Nurses in CLL Care

Nurse Consult 3: Options for a CLL Patient After Multiple Relapses

John is a 69-year-old patient with CLL who was initially treated with acalabrutinib after meeting criteria for treatment initiation

- Responded well for 4 years
- Subsequently experienced disease progression and treated with venetoclax/rituximab (MURANO regimen)
- After a second relapse, he starts therapy with a PI3Ki—but rapidly progresses

Testing shows

- Unmutated IGHV
- No *TP53* mutation/del(17p)

Would additional therapy with a covalent BTKi or venetoclax be useful?

Or should newer options be considered?

In Current Guidelines, BTK Inhibitors and Venetoclax Regimens Are Preferred Options for R/R CLL...

NCCN Recommendations for Second-Line and Subsequent Therapy, No del(17p)/TP53 Mutations¹



Single-agent venetoclax, idelalisib (+ rituximab), and duvelisib are among the other targeted options recommend

1. NCCN Clinical Practice Guidelines in Oncology. Chronic Lymphocytic Leukemia/Small Lymphocytic Lymphoma. Version 2.2022. https://www.nccn.org/professionals/physician_gls/pdf/cll.pdf.

... Including in High-Risk Settings

NCCN Recommendations for CLL With del(17p)/TP53 Mutations¹

Second-Line and Subsequent Therapy			
Preferred Regimens	Other Recommended Regimens		
 Acalabrutinib (category 1) Ibrutinib (category 1) Venetoclax + rituximab (category 1) Venetoclax) Zanubrutinib 	 Alemtuzumab ± rituximab Duvelisib HDMP + rituximab Idelalisib ± rituximab Lenalidomide ± rituximab Obinutuzumab 		

Chemoimmunotherapy is NOT recommended

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1. NCCN Clinical Practice Guidelines in Oncology. Chronic Lymphocytic Leukemia/Small Lymphocytic Lymphoma. Version 2.2022. https://www.nccn.org/professionals/physician_gls/pdf/cll.pdf.

Planning for Sequential Treatment in CLL

If you start with …	and progression occurs	then consider
A covalent BTK inhibitor		Venetoclax ¹
Fixed-duration venetoclax + CD20 antibody		BTK inhibitors ^{2,3}

1. Jones JA et al. Lancet Oncol. 2018;19:65-75. 2. Mato AR et al. Clin Cancer Res. 2020;26:3589-3596. 3. Harrup RA et al. ASH 2020. Abstract 3139.



Planning for Sequential Treatment in CLL (Cont'd)

For patients unable to to to to to to the to the to the to the total series and the total series are the total series and the total series are the total series and the total series are total series are the total series are the total series	►	Consider sequencing to a more selective covalent BTKi (acalabrutinib or zanubrutinib) or venetolax ^{1-3,a}
What about "double- refractory" disease?		A more challenging setting with few approved options

Note: In the setting of progression on a covalent BTKi, sequencing to another covalent BTKi is unlikely to be effective

^a Zanubrutinib is off-label for CLL but is included in the NCCN Guidelines exactly for these circumstances. 1. Jones JA et al. *Lancet Oncol.* 2018;19:65-75. 2. Rogers KA et al. *Haematologica*. 2021;106:2364-2373. 3. Shadman M et al. ASH 2020. Abstract 2947.



What Strategies Can We Use in Heavily Pretreated or Double-Refractory CLL?

Potential Benefits

- Noncovalent BTK inhibitors: initial evidence suggests potent efficacy against resistance mutations and in the setting of progressive disease
- CAR-T therapy: highly active in pretreated CLL

Unlikely to Benefit

- PI3K inhibitors: limited benefit in this population and significant toxicity burden
- Chemoimmunotherapy: limited benefit in this population
- **Covalent BTKi:** patients have already progressed on these agents

Pirtobrutinib¹

- Pirtobrutinib is a noncovalent, reversible BTK inhibitor
- Highly selective, reducing the potential for off-target toxicities
- Active against *BTK* resistance mutations (eg, C481S)
- Recommended dosage from clinical trials: 200 mg daily



More selective/less off-target effects

Results From the BRUIN Trial Show Pirtobrutinib Is Active in R/R CLL/SLL¹



1. Mato AR et al. ASH 2021. Abstract 391.



Most Data Show That Pirtobrutinib Has a Low Rate of BTK-Mediated AEs

Safety Summary From Longer Follow-Up of the BRUIN Trial (N = 618)¹

	Treatment-Emergent AEs (≥15%), %				
	Grade 1	Grade 2	Grade 3	Grade 4	Any Grade
Adverse event					
Fatigue	13	8	1	_	23
Diarrhea	15	4	<1	<1	19
Neutropenia ^a	1	2	8	6	18
Contusion	15	2	_	_	17
Adverse events of special interest ^b					
Bruising ^c	20	2	_	_	22
Rash ^d	9	2	<1	_	11
Arthralgia	8	3	<1	_	11
Hemorrhage ^e	5	2	1 g	-	8
Hypertension	1	4	2	-	7
AF/flutter ^f	-	1	<1	<1	2 ^h

^a Aggregate of neutropenia and neutrophil count decreased. ^b AEs of special interest are those that were previously associated with covalent BTK inhibitors. ^c Aggregate of contusion, petechiae, ecchymosis, and increased tendency to bruise. ^d Aggregate of all preferred terms, including rash. ^e Aggregate of all preferred terms, including hematoma or hemorrhage. ^f Aggregate of atrial fibrillation and atrial flutter. ^g Represents 6 events (all grade 3), including 2 cases of postoperative bleeding; 1 case each of GI hemorrhage in the setting of sepsis, NSAID use, and chronic peptic ulcer disease; and 1 case of subarachnoid hemorrhage in the setting of traumatic bike accident. ^h Of 10 total AF/atrial flutter TEAEs, 3 occurred in patients with a prior medical history of AF, 2 in patients presenting with concurrent systemic infection, and 2 in patients with both.

Assessing the CAR-T Option in CLL

Overview of CAR-T Cell Therapy^{1,2}



1. https://labiotech.eu/immuno-oncology-history-car-t-nyt/. 2. Levine BL. Cancer Gene Ther. 2015;22:79-84.

Robust Efficacy of Liso-Cel in Pretreated CLL Patients¹

In the TRANSCEND CLL 004 trial, patients

- Failed or were ineligible for BTKi
- Had high-risk disease: failed ≥2 prior therapies
- Had standard-risk disease: failed ≥3 prior therapies

In this heavily pretreated population: high rates of response (82% ORR)



Robust Efficacy of Liso-Cel in Pretreated CLL Patients¹ (Cont'd)

In the TRANSCEND CLL 004 trial, patients

- Failed or were ineligible for BTKi
- Had high-risk disease: failed ≥2 prior therapies
- Had standard-risk disease: failed ≥3 prior therapies

In this heavily pretreated population: median PFS of 18 months (13 months in double-refractory patients)



Treatment-Emergent AEs With Liso-Cel Included CRS and Neurologic Toxicity¹

• No late or delayed AEs of concern have emerged with longer follow-up

Parameter	Monotherapy Cohort (N = 23)	BTKi Progression/Venetoclax Failure Subgroup (n = 11)
Common grade 3/4 TEAEs, n (%)		
Anemia	17 (74)	7 (64)
Thrombocytopenia	16 (70)	6 (55)
Neutropenia/neutrophil count decrease	16 (70)	8 (73)
Leukopenia	10 (43)	2 (18)
CRS All-grade CRS, n (%) Median time to CRS onset, days (range) Median duration of CRS, days (range) Grade 3 CRS, n (%)	17 (74) 3 (1-10) 12 (2-50) 2 (9)	7 (64) 1 (1-10) 15 (5-50) 2 (18)
NEs All-grade NEs, n (%) Median time to NE onset, days (range) Median duration of NE, days (range) Grade ≥3 NEs, n (%)	9 (39) 4 (2-21) 20.5 (6-50) 5 (22)	5 (46) 4 (2-21) 38 (6-50) 3 (27)

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1. Siddiqi T et al. ASH 2020. Abstract 546.

Overview of CAR-T Cell Therapy Adverse Events



Take-Homes on Managing CRS¹



 Goal: prevent multisystem organ failure but do not stop the CAR-T cells from working

Treatment

- Supportive care
- Tocilizumab: monoclonal antibody to IL-6 receptor; blocks IL-6–mediated inflammatory effects
- Steroids (if no improvement with tocilizumab)

Neurotoxicity^{1,2}

- Cause: unclear
 - Cytokine mediated
 - T-cell mediated
- Risk factors: unclear
 - High disease burden
 - Concurrent CRS
- Treatment
 - Supportive care
 - Levetiracetam



1. Maude SL et al. *Blood*. 2015;125:4017-4023. 2. Bonifant CL et al. *Mol Ther Oncolytics*. 2016;3:16011.

What Would the CAR-T Process Look Like in CLL? Based on the NHL Experience ...

Patient found to be eligible for CAR-T



Get to Know the CAR-T Management Team



Nurse Consult 3: Recommendations for John

Recommendations

- Be honest: In John's case, it's unlikely conventional options are going to be useful
- Educate on the potential of clinical trial therapy
- ✓ Offer resources for trial enrollment/information
- Trial-based options could include CAR-T therapy (eg, liso-cel) or noncovalent BTKi (pirtobrutinib)

John is a 69-year-old patient with CLL who was initially treated with acalabrutinib after meeting criteria for treatment initiation

- Responded well for 4 years
- Subsequently experienced disease progression and treated with venetoclax/rituximab (MURANO regimen)
- After a second relapse, he starts therapy with a PI3Ki—but rapidly progresses

Testing shows

- Unmutated IGHV
- No *TP53* mutation/del(17p)

Would additional therapy with a covalent BTKi or venetoclax be useful?

Or should newer options be considered?

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Use patient-appropriate tools to educate on the potential of novel modalities such as CAR-T

CLL Society Tools for Patient Education: Resources for Understanding CAR-T Therapy

Talk to your patients: CLL Society offers dedicated CAR-T resources, available at: www.cllsociety.org/CAR-T

- Extensive resource library
- CAR-T blog
- 1-page informational brochure
- CAR-T comic book

Welcome to the CAR-T Resource Library

Free CAR-T Therapy Brochure for Chronic Lymphocytic Leukemia/Small Lymphocytic Lymphoma (CLL/SLL) Patients



The CAR-T Blog



Coming Full Circle: How to Prepare for the Future of CLL Care

Many Studies Are Testing BTKi and Venetoclax Combinations

CAPTIVATE¹

 Assessed fixed-duration and MRDguided ibrutinib/venetoclax

GLOW was a phase 3 trial of fixed-duration ibrutinib/venetoclax²

Triplets combining multiple novel agents are also being tested

High rates of uMRD with fixedduration therapy, including in patients with high-risk disease features

Improved PFS and CR with fixed-duration ibrutinib and venetoclax versus CIT

Ibrutinib, acalabrutinib, or zanubrutinib plus venetoclax and obinutuzumab

The Early Experience With Ibrutinib/Venetoclax: Reductions in TLS Risk Through Effective Debulking

- In the CAPTIVATE trial, the safety profile of ibrutinib/venetoclax was consistent with known AEs for each agent alone (no new safety signals observed)¹
- Debulking with lead-in ibrutinib reduced the severity of TLS

Impact of single-agent ibrutinib lead-in on TLS risk category



Three cycles of single-agent ibrutinib reduced TLS risk category in 90% of patients with high baseline risk and only 2% remained in the high-risk category before initiation of venetoclax ramp-up

What Does This Mean for Nurses? How Can Nurses Prepare for Novel Combinations?

- Different issues may arise with BTKi/venetoclax combinations
 - Two distinct AE profiles—be prepared for both or newer, more severe manifestations (particularly with triplets)
 - Financial assistance programs may be available, many resources can help (CLL Society)
- Educate patients and caregivers
 - They will have questions as they experience these newer modalities
 - They will ask you questions they don't ask doctors—be prepared and know how to answer and where to direct queries
Take-Homes

The CLL treatment landscape continues to change quickly: be adaptable and use the skills we've learned over years of using novel therapy in CLL

Newer drugs are coming, including within existing drug classes

Be prepared for unique modalities: CAR-T therapy

Newer targeted combinations will change our focus, so stay vigilant and be prepared



Audience Q&A





Please remember to complete and submit your Post-Test and Evaluation for CE credit.

PeerView.com/CLL-Survey-QWZ

Thank you and have a good day.



Abbreviations

AF: atrial fibrillation AKI: acute kidney injury ALC: absolute lymphocyte count ALL: acute lymphocytic leukemia ASO: antisense oligonucleotide axi-cel: axicabtagene ciloleucel BCL-2: B cell lymphoma 2 BCL-2i: B cell lymphoma 2 inhibitor BM[·] bone marrow BR: bendamustine plus rituximab brexu-cel: brexucabtagene autoleucel BTK: Bruton tyrosine kinase BTKi: Bruton tyrosine kinase inhibitor CAR: chimeric antigen receptor CAR-T: chimeric antigen receptor T cell

Cbl: chlorambucil CCM: certified case manager CD19: cluster of differentiation 19 CIBMTR[•] Center for International Blood and Marrow Transplant Research **CIRS:** Cumulative Illness Rating Scale CIT: chemoimmunotherapy CLL: chronic lymphocytic leukemia COVID-19: coronavirus disease 2019 CR: complete response CRA: clinical research associate CrCI: creatinine clearance CRi: complete remission with incomplete hematologic recovery CRP: C-reactive protein CRS: cytokine-release syndrome

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Abbreviations

CYP3A: cytochrome P3A del(17p): deletion 17p DIC: disseminated intravascular coagulation DI 1⁻ dose level 1 DI 2⁻ dose level 2 FOT end of treatment FACT: Foundation for the Accreditation of Cellular Therapy FCR: fludarabine, cyclophosphamide, and rituximab FL: follicular lymphoma G: obinutuzumab G-CSF: granulocyte colony-stimulating factor GVHD: graft-versus-host disease HTN: hypertension I: ibrutinib IGHV: immunoglobulin heavy-chain gene

IL-6: interleukin 6 IR: ibrutinib + rituximab iwCLL: International Workshop on Chronic Lymphocytic Leukemia LDH: lactate dehydrogenase liso-cel: lisocabtagene maraleucel LN: lymph node LOC: level of consciousness MCL: mantle cell lymphoma MRD: minimal residual disease NCCN: National Comprehensive Cancer Network NE: not evaluable NGS: next-generation sequencing NHL: non-Hodgkin lymphoma nPR[·] nodular PR

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Abbreviations

NR: not reached	SD: stable disease
O-Clb: obinutuzumab plus chlorambucil	SLL: small lymphocytic lymphoma
ORR: overall response rate	TEAE: treatment-emergent adverse event
P-gp: P-glycoprotein	tisagen: tisagenlecleucel
PB: peripheral blood	TLS: tumor lysis syndrome
PD: progressive disease	TN: treatment naïve
PI3K: phosphatidylinositol-4,5-bisphosphate 3-kinase	TP53: tumor protein 53
PI3Ki: phosphatidylinositol-4,5-bisphosphate 3-kinase inhibitor	uMRD: undetectable minimal residual disease
PLT: platelet	VenG: venetoclax plus obinutuzumab
PPI: proton pump inhibitor	
PR: partial response	
PT: physical therapy	

R/R: relapsed/refractory

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