Ongoing Phase II Study and ECHELON-2 and ALCANZA Phase III Trials of Brentuximab Vedotin in CD30-Positive Mature T-Cell Lymphomas
CME INFORMATION

OVERVIEW OF ACTIVITY

Each year, thousands of clinicians, basic scientists and other industry professionals sojourn to major international oncology conferences, like the American Society of Clinical Oncology (ASCO) annual meeting and the International Conference on Malignant Lymphoma (ICML), to hone their skills, network with colleagues and learn about recent advances altering state-of-the-art management in hematologic oncology. As such, these events have become global stages where exciting science, cutting-edge concepts and practice-changing data emerge on a truly grand scale. This massive outpouring of information has enormous benefits for the hematologic oncology community, but the truth is it also creates a major challenge for practicing oncologists and hematologists.

Although original data are consistently being presented and published, the flood of information unveiled during a major academic conference is unprecedented and leaves in its wake an enormous volume of new knowledge that practicing oncologists must try to sift through, evaluate and consider applying. Unfortunately and quite commonly, time constraints and an inability to access these data sets leave many oncologists struggling to ensure that they are aware of crucial practice-altering findings. This creates an almost insurmountable obstacle for clinicians in community practice because not only are they confronted almost overnight with thousands of new presentations and data sets, but they are also severely restricted in their ability to review and interrogate the raw findings.

To bridge the gap between research and patient care, this CME activity will deliver a serial review of the most important ongoing trials and emerging data sets on novel agents in T-cell lymphoma from the latest ASCO and ICML meetings, including expert perspectives on how these new evidence-based concepts may be applied to routine clinical care. This activity will assist medical oncologists, hematologists and hematology-oncology fellows in the formulation of optimal clinical management strategies and the timely application of new research findings to best-practice patient care.

LEARNING OBJECTIVES

• Evaluate emerging efficacy and safety data with the anti-CD30 agent brentuximab vedotin and the novel histone deacetylase inhibitor belinostat as therapy for patients with relapsed or refractory T-cell lymphoma.

• Demonstrate knowledge of currently recruiting trials of the targeted agents brentuximab vedotin, belinostat and romidepsin as single agents or in combination with chemotherapy, and counsel appropriate patients with T-cell lymphoma for participation in these ongoing trials.

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FACULTY — The following faculty (and their spouses/partners) reported real or apparent conflicts of interest, which have been resolved through a conflict of interest resolution process:

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Hardware/Software Requirements:
A high-speed Internet connection
A monitor set to 1280 x 1024 pixels or more
Internet Explorer 7 or later, Firefox 3.0 or later, Chrome, Safari 3.0 or later
Adobe Flash Player 10.2 plug-in or later
Adobe Acrobat Reader
(Optional) Sound card and speakers for audio

Last review date: October 2013
Expiration date: October 2014
To go directly to slides and commentary for this issue, click here.

One of the best examples of the recent transformation of clinical and translational science in the many variants of T-cell lymphoma (TCL) was a case presented by Dr Andrew Evens during a lymphoma think tank we hosted this summer in our Miami recording studio.

This 61-year-old man was diagnosed 2 years ago with Stage IV ALK-negative anaplastic large-cell lymphoma (ALCL) and received CHOEP — a common up-front choice among investigators — which resulted in a complete response (CR). Like many patients with peripheral T-cell lymphoma (PTCL) who hear the pros and cons of various forms of transplant, the patient balked at taking that difficult step and was followed expectantly for a year, when an obvious and significant recurrence was detected. Until recently this man’s treatment options would have been confined to intensive salvage chemotherapy regimens, like ICE, DHAP and ESHAP, and other less intense options, including romidepsin, pralatrexate and other agents, but in 2013 we know that ALCL is uniformly CD30-positive and, as with about 60% of individuals with this disease who receive the antibody-drug conjugate (ADC) brentuximab vedotin (BV), this patient experienced a rapid CR and no significant toxicity. He then reconsidered his decision and elected to receive an autologous stem cell transplant and remains in CR 6 months later.

Unlike many other corners of oncology, including B-cell lymphomas, for which novel agents and strategies abound, TCL has until recently been devoid of these hopeful entities and the unfortunate result is painfully evident in a recent JCO paper. This retrospective study of 153 patients in British Columbia who underwent treatment for PTCL (mostly PTCL NOS, angioimmunoblastic TCL [AITL] or ALCL) from 1976 to 2010 demonstrated a dismal median time from diagnosis to first relapse of 6.7 months and an even worse 5.5 months from first relapse to death. However, as seen with Dr Evens’ patient, critical inroads have now been made, and equally as important, an effective clinical research infrastructure has emerged that is generating well-designed and executed studies. The ASCO and Lugano TCL papers summarized on this issue of 5-Minute Journal Club typify recent steps forward and shine a light on where we might be in a few years.
1. **Belinostat: The BELIEF Phase II trial**

The big T-cell story out of ASCO was this report of significant single-agent activity with a 26% response rate with this novel pan-histone deacetylase inhibitor (HDACi) in patients with relapsed/refractory (R/R) PTCL. Although on the surface some might review the data and think this is just another HDACi, during a recent interview for our audio series BELIEF principal investigator Dr Owen O’Connor discussed the potential game-changing difference of this drug. Specifically, unlike other agents with significant activity in PTCL, including romidepsin, the rate of myelosuppression is relatively low with belinostat and as such it can be administered to patients with platelet counts above 50,000.

From a clinical perspective this unique attribute may prove invaluable in the R/R setting, in which many patients have poor marrow reserve because of prior chemotherapy and in some cases transplant. Similarly, in terms of clinical research belinostat may be safer and easier to combine with chemotherapy, potentially allowing for more effective drug delivery — a strategy now being tested in up-front trials. The news did not stop at ASCO, as in Lugano Dr Steven Horwitz presented further data from BELIEF demonstrating that patients with AITL were particularly likely to benefit from the drug (46% response rate). These data have led many to become “believers” that belinostat may have real value and perhaps a role soon in clinical practice.

2. **CD30 and BV**

We’ve talked a lot about this fascinating ADC in past programs, but the database continues to build and at Lugano we saw an interesting report from a Phase II US trial of 29 patients with mature T-/NK-cell lymphomas. Importantly, of 17 patients with postbaseline assessments, all but 3 experienced tumor size decreases and CRs were observed in 4 of 10 patients with AITL and 2 of 12 patients with PTCL NOS. These and prior data sets suggest that clinicians might want to consider CD30 testing for all patients with PTCL and maybe some B-cell cancers like diffuse large B-cell lymphoma along with cutaneous TCL, in which an ongoing Phase III trial is evaluating the efficacy of BV and anecdotal benefit has been observed. Interestingly, the correlation between CD30 status and response to BV is not as clear as one might think, and this paper like others before it reports durable responses in patients with low or undetectable CD30 expression.

Last week in the Big Apple during the first of our 4 daylong regional Year in Review (YIR) symposia, Dr Bruce Cheson commented on the challenge of using this marker and cited the example of Hodgkin lymphoma, in which most cells in the tumor mass are stroma and are CD30-negative but virtually all Reed-Sternberg cells have the antigen, thus explaining the impressive clinical activity in these patients. Another YIR faculty member, Dr Lauren Pinter-Brown, commented on 2 other factors confounding current CD30 evaluation, namely tumor heterogeneity and the evolution of newer, more sensitive assays, including quantitative image analysis, that may be able to identify
many more patients than the estimated 30% with PTCL currently considered to have CD30-positive tumors. Where this leads in the future is uncertain, but it’s possible that BV and other ADCs will eventually be utilized in most patients with TCL.

3. The next generation of TCL clinical trials

Despite the many advances in TCL treatment, continued research is of course needed, and at ASCO Dr O’Connor presented a Trials in Progress poster (TPS) featuring the newly launched and much anticipated Phase III ECHELON-2 study. This critical effort compares up-front CHOP to CHBVP, in which BV replaces vincristine in the front-line treatment of patients with CD30-positive mature TCLs, and should be widely embraced by clinicians who otherwise must turn to suboptimal standard options. In a similar manner, another relevant ASCO TPS focused on the Phase III RoCHOP trial, which adds the HDACi romidepsin to CHOP in patients with previously untreated PTCL. In terms of new agents, Dr Anas Younes, the new Chief of the Memorial Sloan-Kettering Lymphoma Service, in a brilliant ASCO review of many exciting ADCs in development said it’s “prime time” for these agents in lymphoid cancers. He then underscored the immense value of this therapeutic concept by noting the important example of ALCL, where the unconjugated anti-CD30 antibody produced a 17% response rate that increased to 86% when the same naked antibody was conjugated to monomethyl auristatin E (MMAE).

Many other novel agents and strategies are being actively investigated in TCL, and Dr Pinter-Brown told our highly attentive and knowledgeable New York audience that TCL needs a “rituximab.” In that regard, she is intrigued by mogamulizumab, a defucosylated humanized monoclonal antibody targeting C-C chemokine receptor 4 (CCR4) that is approved in Japan for R/R adult T-cell leukemia/lymphoma and is currently working its way through trials in North America, where the face of this disease is considerably different.

Next, for our final issue of this series on summer heme-onc data sets we flip back to the “B” side and check out papers on follicular, mantle-cell and diffuse large B-cell lymphoma.

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Ongoing Phase II Study and ECHELON-2 and ALCANZA Phase III Trials of Brentuximab Vedotin in CD30-Positive Mature T-Cell Lymphomas

Presentations discussed in this issue

O’Connor OA et al. **ECHELON-2: Phase 3 trial of brentuximab vedotin and CHP versus CHOP in the frontline treatment of patients (Pts) with CD30+ mature T-cell lymphomas (MTCL).** *Proc ICML* 2013;**Abstract 138.**

Oki Y et al. **Safety and efficacy of brentuximab vedotin for treatment of relapsed or refractory mature T-/NK-cell lymphomas.** *Proc ICML* 2013;**Abstract 152.**

Kim YH et al. **Phase 3 study of brentuximab vedotin versus physician’s choice of methotrexate or bexarotene in patients (Pts) with CD30-positive (CD30+) cutaneous T-cell lymphoma (CTCL). The ALCANZA study.** *Proc ICML* 2013;**Abstract 572.**

Slides from presentations at ICML 2013 and transcribed comments from recent interviews with Owen A O’Connor, MD, PhD (8/20/13) and Julie M Vose, MD, MBA (7/19/13)

**ECHELON-2: Phase 3 Trial of Brentuximab Vedotin and CHP versus CHOP in the Frontline Treatment of Patients (Pts) with CD30+ Mature T-Cell Lymphomas (MTCL)**

**Safety and Efficacy of Brentuximab Vedotin for Treatment of Relapsed or Refractory Mature T-/NK-Cell Lymphomas**

**Phase 3 Study of Brentuximab Vedotin versus Physician’s Choice of Methotrexate or Bexarotene in Patients (Pts) with CD30-Positive (CD30+) Cutaneous T-Cell Lymphoma. The ALCANZA Study**

**1O’Connor OA et al.**
*Proc ICML* 2013; Abstract 138; *Proc ASCO* 2013; Abstract TPS8611.

**2Oki Y et al.**
*Proc ICML* 2013; Abstract 152.

**3Kim YH et al.**
*Proc ICML* 2013; Abstract 572.
ECHELON-2: Phase 3 Trial of Brentuximab Vedotin and CHP versus CHOP in the Frontline Treatment of Patients (Pts) with CD30+ Mature T-Cell Lymphomas (MTCL)

O’Connor OA et al.
Proc ICML 2013;Abstract 138;
Proc ASCO 2013;Abstract TPS8611.

Background

- MTCLs, including systemic anaplastic large cell lymphoma (sALCL), are aggressive neoplasms.
- Anthracycline-based multiagent chemotherapy regimens have demonstrated response rates ranging from 76% to 88% (JCO 2012;30(25):3093-9).
- Brentuximab vedotin is an anti-CD30 monoclonal antibody conjugate that has demonstrated activity in a pivotal Phase II study as a single agent in relapsed/refractory sALCL (JCO 2012;30(18):2190-6).
- In a Phase I study, it showed evidence of clinical activity when used in combination with CHP as front-line therapy for sALCL (Proc ASH 2012;Abstract 60).

**Study objective:** To evaluate the safety and efficacy of brentuximab vedotin with CHP versus CHOP as front-line therapy for patients with CD30-positive MTCL.

Ongoing Phase III ECHELON-2 Trial Design (NCT01777152)

**Target accrual (n = 300)**
- Newly diagnosed CD30-positive MTCL
- Fluorodeoxyglucose (FDG)-avid disease by PET
- Measurable disease ≥1.5 cm by CT

**1:1 randomization**
- Brentuximab/CHP
  - Every 3 weeks
  - 6–8 cycles
- CHOP
  - Every 3 weeks
  - 6–8 cycles

Study start date: January 2013
Estimated study completion date: December 2019
Brentuximab vedotin dose: 1.8 mg/kg (IV)

- **Primary endpoint:** Progression-free survival (PFS) by independent review
- **Secondary endpoints include:** PFS in sALCL by independent review, complete remission rate, overall survival, objective response rate, safety


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**Study Methods**

- Patients will be stratified prior to randomization by:
  - ALK-positive sALCL versus other histologic subtypes
  - International prognostic index score (0-1, 2-3 or 4-5)
- The target proportion of patients with a diagnosis of sALCL will be 75%.
- After completion of treatment, all patients will be followed for disease progression, medical resource utilization, quality of life and survival.
- Post-treatment stem cell transplant is allowed.

Efficacy and Safety Assessments

- CT and PET scans will be performed:
  - At baseline
  - After Cycle 4
  - After completion of treatment
- CT scans will also be performed at regular intervals during follow-up until disease progression, death or analysis of primary endpoint.
- An independent data monitoring committee will review safety data on an ongoing basis.
- Safety assessments will occur throughout the study until 30 days after last dose of study treatment.


Assessment of Peripheral Neuropathy and Patient-Reported Outcomes

- Peripheral neuropathy will be graded according to Common Terminology Criteria for Adverse Events and all dose modifications will be based on these grades.
- In addition, Total Neuropathy Score — nurse (TNSn) will be used to assess the onset and resolution of peripheral neuropathy:
  - TNSn is designed to be used by trained medical professionals, not restricted to neurologists or physicians.
  - TNSn includes the measure of sensory, autonomic and motor symptoms; pin sensibility; and vibration sensibility.
- Patient-reported outcomes will include questionnaires completed prior to the administration of treatment on study days:
  - Patient reports may be collected by phone upon disease progression and during survival follow-up.

O’Connor OA et al. Proc ASCO 2013;Abstract TPS8611.
Investigator Commentary: Ongoing ECHELON-2 Trial of Front-Line Brentuximab Vudotin/CHP versus CHOP in CD30-Positive MTCL

The ECHELON-2 trial is a registration-directed study. I believe that the study is important because of the addition of brentuximab to CHP. Since it is only for CD30-positive MTCL, it will account for about a third of patients with T-cell lymphoma. At the moment, accrual is relatively slow as people get their arms around considering CD30 as part of their up-front diagnostic workup for patients with these diseases, but this trial could have a significant impact on the natural history of T-cell lymphoma. The early signals in patients with CD30-positive T-cell lymphoma and diffuse large B-cell lymphoma suggest that this agent is highly active in those patients. I believe that it may represent one of our first big advances to a CHP backbone by adding something new that could advance the up-front induction care of these patients. At the planning stage of the trial, the treatment schedule was a big discussion. The FDA judged that a fair comparison should include 6 to 8 cycles of CHOP chemotherapy versus 6 to 8 cycles of brentuximab vedotin/CHP. The trial includes no provision to administer an extended brentuximab vedotin regimen to patients who are randomly assigned to that treatment arm.

Interview with Owen A O’Connor, MD, PhD, August 20, 2013

Safety and Efficacy of Brentuximab Vudotin for Treatment of Relapsed or Refractory Mature T-/NK-Cell Lymphomas

Oki Y et al.
Proc ICML 2013;Abstract 152.
Background

- The MTCL subtypes angioimmunoblastic T-cell lymphoma (AITL) and PTCL not otherwise specified (PTCL-NOS) generally respond poorly to chemotherapy and often relapse (JCO 2013;31(16):1970).
- Few effective treatment options are available and there is no standard therapy for relapsed/refractory MTCL.
- CD30 is a target antigen variably expressed on several non-Hodgkin lymphoma cells, including B-cell lymphomas and MTCLs.
- Brentuximab vedotin is an anti-CD30 monoclonal antibody conjugate.
- **Study objective:** To assess the safety and efficacy of brentuximab vedotin in relapsed or refractory CD30-positive MTCL.

Oki Y et al. Proc ICML 2013;Abstract 152.

Phase II Trial Design

<table>
<thead>
<tr>
<th>Eligibility (n = 29)*</th>
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<tbody>
<tr>
<td>CD30-positive non-Hodgkin lymphoma by IHC</td>
</tr>
<tr>
<td>Relapsed or refractory disease</td>
</tr>
<tr>
<td>≥1 prior systemic therapy</td>
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</tbody>
</table>

Brentuximab vedotin
1.8 mg/kg (IV) every 3 weeks

Restage at cycles 2, 4 and every 3 cycles thereafter

* Enrollment to date

- Diagnosis excludes anaplastic large-cell lymphoma (ALCL), Sézary syndrome and mycosis fungoides (MF) but includes:
  - AITL: n = 11
  - PTCL-NOS: n = 18
- **Primary endpoint:** Objective response rate (ORR)
- **Secondary endpoints include:** Correlation of CD30 expression with response, progression-free survival and safety

Oki Y et al. Proc ICML 2013;Abstract 152.
Maximal Tumor Volume Reduction

17 of 18 patients with postbaseline CT assessments

With permission from Oki Y et al. Proc ICML 2013;Abstract 152.

Maximal Tumor Volume Reduction by Frequency of CD30+ Cells

Objective responses observed in patients with undetectable CD30 expression and expression up to 15%

Includes patients with both postbaseline radiographic response assessments and CD30 expression data

With permission from Oki Y et al. Proc ICML 2013;Abstract 152.
### Best Clinical Response

<table>
<thead>
<tr>
<th>Response rate</th>
<th>All patients (n = 22)</th>
<th>AITL (n = 10)</th>
<th>PTCL-NOS (n = 12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ORR</td>
<td>36%</td>
<td>50%</td>
<td>25%</td>
</tr>
<tr>
<td>Complete response</td>
<td>27%</td>
<td>40%</td>
<td>17%</td>
</tr>
<tr>
<td>Partial response</td>
<td>9%</td>
<td>10%</td>
<td>8%</td>
</tr>
<tr>
<td>Stable disease</td>
<td>27%</td>
<td>20%</td>
<td>33%</td>
</tr>
<tr>
<td>Progressive disease</td>
<td>36%</td>
<td>30%</td>
<td>42%</td>
</tr>
</tbody>
</table>

Median duration of response: Not yet reached

Oki Y et al. *Proc ICML* 2013;Abstract 152.

### Adverse Events (AEs) Occurring in >10% of Patients

<table>
<thead>
<tr>
<th>AEs (n = 29)</th>
<th>All grades</th>
<th>Grade 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any AE</td>
<td>72%</td>
<td>28%</td>
</tr>
<tr>
<td>Fatigue</td>
<td>24%</td>
<td>0%</td>
</tr>
<tr>
<td>Pyrexia</td>
<td>17%</td>
<td>0%</td>
</tr>
<tr>
<td>Chills</td>
<td>14%</td>
<td>3%</td>
</tr>
<tr>
<td>Decreased appetite</td>
<td>14%</td>
<td>3%</td>
</tr>
<tr>
<td>Peripheral sensory neuropathy</td>
<td>14%</td>
<td>0%</td>
</tr>
<tr>
<td>Rash</td>
<td>14%</td>
<td>3%</td>
</tr>
</tbody>
</table>

- Grade 3 neutropenia (n = 3)
- Grade 4 AEs to date include: Pulmonary edema, increased lipase and confused state (n = 1 each)

Oki Y et al. *Proc ICML* 2013;Abstract 152.
Author Conclusions

- In this interim analysis, brentuximab vedotin demonstrated antitumor activity in patients with AITL
  - Objective response rate: 50% (CR = 40%; PR = 10%)
  - Median duration of response: not reached
- Durable responses were observed in patients across a broad range of CD30 expression, including those with low or undetectable CD30 expression.
- Brentuximab vedotin demonstrated antitumor activity in patients with relapsed/refractory MTCL and a safety profile consistent with labeled indications.

Oki Y et al. *Proc ICML 2013;Abstract 152.*

Investigator Commentary: Safety and Efficacy of Brentuximab Vedotin in Relapsed or Refractory Mature T-/NK-Cell Lymphomas

This is a Phase II trial evaluating brentuximab vedotin for relapsed and refractory CD30-positive T-/NK-cell lymphomas that do not include ALC. This setting is technically not an indication for brentuximab vedotin at the moment, but interest has arisen in evaluating this drug in different patient populations. Data were presented with a small number of patients from the trial so far, about 29 patients, and the authors specifically evaluated PTCL-NOS and angioimmunoblastic T-cell lymphoma (AITL). In the overall patient population the response rate was fairly high. It was about 36% for these patients. Among patients with AITL, about 50% of the patients responded, including 4 complete responses. Apparently this represents an interesting signal with which to move forward particularly in the population of patients with AITL.

*Interview with Julie M Vose, MD, MBA, July 19, 2013*
Phase 3 Study of Brentuximab Vedotin versus Physician’s Choice of Methotrexate or Bexarotene in Patients (Pts) with CD30-Positive (CD30+) Cutaneous T-Cell Lymphoma (CTCL). The ALCANZA Study


Background

- A Phase II trial demonstrated clinical activity and a manageable safety profile with brentuximab vedotin in relapsed/refractory CD30+ mycosis fungoides (Proc ASH 2012;Abstract 797).
  - Overall response rate (ORR): 13/19 (68%)
- Another Phase II trial demonstrated that brentuximab vedotin is an effective and safe targeted therapy for CD30+ CTCL and cutaneous lymphoproliferative disorders (Proc ASH 2012;Abstract 3688).
  - ORR: 63% (24/38)
- The most common adverse events associated with brentuximab vedotin include peripheral neuropathy and fatigue.

**Study objective:** To evaluate the efficacy and safety of brentuximab vedotin versus physician’s choice in CD30+ CTCL.

**Ongoing Phase III ALCANZA Trial Design (NCT01578499)**

**Target accrual (n = 124)**
- CD30+ CTCL, including MF or pALCL
- ≥1 prior systemic therapy
- No prior treatment with brentuximab vedotin

**Brentuximab vedotin**
- 1.8 mg/kg every 3 weeks for up to 16 cycles

**Physician’s choice**
- Methotrexate: 5-50 mg, q1wk
- Bexarotene: 300 mg/m² qd

Study start date: August 2012
Estimated study completion date: June 2015
MF = mycosis fungoides; pALCL = primary cutaneous anaplastic large-cell lymphoma

- **Primary endpoint:** ORR lasting ≥4 months
- **Secondary endpoints include:** Complete response, progression-free survival and changes in burden of symptom domain per Skindex-29 questionnaire


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**Study Treatments**

- Patients will be stratified by diagnosis and randomly assigned to receive brentuximab vedotin or physician’s choice of methotrexate or bexarotene.
- Patients who achieve a complete or partial response at cycle 3 may continue the study drug for up to 48 weeks.
- Patients with stable disease and evidence of benefit may continue for a further 3 cycles.
- Patients with increasing skin score (modified severity weighted assessment tool; mSWAT) prior to cycle 3 may continue until cycle 3 if it is due to tumor flare.

Efficacy and Safety Assessments

- Response assessments will include:
  - Skin (mSWAT)
  - Nodal and visceral radiographic assessments
  - Detection of circulating Sézary cells (MF only)
- ORR will be evaluated until disease progression or study closure.
- Safety assessments will include:
  - Incidence and severity of adverse events
  - Changes to physical and laboratory tests
- Enrollment into the ALCANZA trial is ongoing.


Investigator Commentary: The Phase III ALCANZA Trial of Brentuximab Veddotin versus Physician’s Choice in CD30+ CTCL

This ongoing Phase III trial is comparing brentuximab to physician’s choice of either methotrexate or bexarotene for patients with CD30-positive cutaneous T-cell lymphoma. Most of these patients would be patients with mycosis fungoides, although other types of CTCL are represented. Prior to this trial studies have evaluated brentuximab vedotin for patients with CTCL, and data from a Phase II study were interesting. Anecdotally, I have used brentuximab for some patients with CTCL and they have had good responses, and I believe this will likely be an important setting to continue to investigate.

Interview with Julie M Vose, MD, MBA, July 19, 2013