



ReachMD Treating Severe Eosinophilic Asthma Patients Who Are OCS-Dependent





INDICATION

 NUCALA is indicated for the add-on maintenance treatment of adult and pediatric patients aged 6 years and older with severe asthma and with an eosinophilic phenotype. NUCALA is not indicated for the relief of acute bronchospasm or status asthmaticus

IMPORTANT SAFETY INFORMATION

CONTRAINDICATIONS

 NUCALA should not be administered to patients with a history of hypersensitivity to mepolizumab or excipients in the formulation.

Please see Important Safety Information for NUCALA throughout this video.
Please see full Prescribing Information, including Patient Information, at NUCALAHCP.com.

Announcer:

NUCALA is indicated for the add-on maintenance treatment of patients 6 years and older with severe eosinophilic asthma.

NUCALA is not for relief of acute bronchospasm or status asthmaticus.

NUCALA should not be used in patients with a history of hypersensitivity to mepolizumab or its formulations.







IMPORTANT SAFETY INFORMATION (cont.)

WARNINGS AND PRECAUTIONS

Hypersensitivity Reactions

 Hypersensitivity reactions (eg, anaphylaxis, angioedema, bronchospasm, hypotension, urticaria, rash) have occurred with NUCALA (mepolizumab). These reactions generally occur within hours of administration but can have a delayed onset (ie, days). If a hypersensitivity reaction occurs, discontinue NUCALA.

Acute Asthma Symptoms or Deteriorating Disease

 NUCALA should not be used to treat acute asthma symptoms, acute exacerbations, or acute bronchospasm.

Opportunistic Infections: Herpes Zoster

 In controlled clinical trials, 2 serious adverse reactions of herpes zoster occurred with NUCALA compared to none with placebo. Consider vaccination if medically appropriate.



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Hypersensitivity reactions including anaphylaxis, angioedema, bronchospasm, hypotension, urticaria, and rash have occurred. These generally occur within hours of administration but can have a delayed onset. If a hypersensitivity reaction occurs, discontinue NUCALA.

NUCALA should not be used to treat acute asthma symptoms, acute exacerbations, or acute bronchospasm.

In controlled clinical trials, 2 serious adverse reactions of herpes zoster occurred with NUCALA compared to none with placebo. Consider vaccination if medically appropriate.







IMPORTANT SAFETY INFORMATION (cont.)

WARNINGS AND PRECAUTIONS (cont.)

Reduction of Corticosteroid Dosage

 Do not discontinue systemic or inhaled corticosteroids abruptly upon initiation of therapy with NUCALA. Decreases in corticosteroid doses, if appropriate, should be gradual and under the direct supervision of a physician. Reduction in corticosteroid dose may be associated with systemic withdrawal symptoms and/or unmask conditions previously suppressed by systemic corticosteroid therapy.

Parasitic (Helminth) Infection

 Treat patients with pre-existing helminth infections before initiating therapy with NUCALA. If patients become infected while receiving NUCALA and do not respond to anti-helminth treatment, discontinue NUCALA until infection resolves.

Additional important safety information, including adverse reactions, is presented later in this presentation.

Please see Important Safety Information for NUCALA throughout this video. Please see full Prescribing Information, including Patient Information, at NUCALAHCP.com.



Do not discontinue systemic or inhaled corticosteroids abruptly when initiating NUCALA. Appropriate decreases in corticosteroid doses should be gradual and healthcare-provider supervised. Reduction in corticosteroid dose may be associated with withdrawal symptoms and/or unmask conditions previously suppressed by corticosteroid therapy.

Treat patients with pre-existing parasitic infections before initiating NUCALA. If patients become infected while receiving NUCALA and do not respond to anti-parasitic treatment, discontinue NUCALA until infection resolves.

Additional important safety information, including adverse reactions, is presented later in this presentation.

Dr. Goldman:

Hello, I'm Dr. Yaron Goldman, and I'm a practicing Pulmonologist.

Thank you for joining me for this talk on treating severe eosinophilic asthma patients who are oral corticosteroid dependent.

As a pulmonologist, I can tell you that this is a significant problem that we encounter quite a bit in our practice. And now that we have additional medication options for the patients, we're excited to share this with you.

We'll start by introducing a typical severe eosinophilic asthma patient who is also OCS dependent.







Sarah L. OCS dependent severe eosinophilic asthma

47 years old 5 ft 4 in, 194 lb Diagnosed with asthma at age 29

■ Medical History and Report

Current Medications

High-dose ICS/LABA + LTRA, OCS 12.5 mg (daily, 9 months), albuterol as needed

Exacerbation History

2 exacerbations treated with OCS in past year; 1 outpatient, 1 ED visit

Patient Report

Daily cough and wheeze with mucus production

Symptoms often restrict daily activities and interfere with work

Weight gain of 15 lbs in last 9 months

Asthma triggers: URIs and sinusitis, smoke (nonsmoker), and exertion

(Atopic status: negative)

Spirometry

Laboratory Assessment

FEV₁: 62% predicted

FEV₁/FVC ratio: 0.70

Fosi

Eosinophil count: 190 cells/µL

Historical eosinophil count (1 year ago): 390 cells/µL

Total IgE 102 kU/L

CBC with differential

URI=upper respiratory infection.

Sarah is maximized on traditional combination therapy, all the way to the higher steps of the GINA report and a significant dose of oral steroids. She already had two exacerbations treated in the past year, one outpatient and one emergency department visit, which is usually a marker of a more severe exacerbation. This tells us that her asthma is not well controlled. She has daily cough and wheezing, and her asthma is restricting her activities. She is also experiencing significant weight gain, which many of our asthmatic patients struggle with.

As you can see, she has multiple triggers, significant obstruction on her spirometry, and elevated eosinophils of 190 cells/ μ L. But keep in mind this is while on daily oral steroids, which can lower the eosinophil count. Note that one year ago, her eosinophil count was even higher at 390 cells/ μ L.

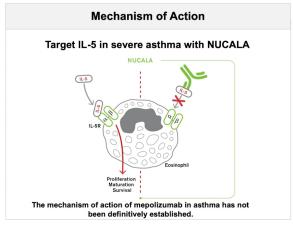




This severe eosinophilic asthma patient is clearly uncontrolled. We need to think about additional treatment options for her. And I'd like to share with you an option called NUCALA.

NUCALA, an IL-5 antagonist for severe eosinophilic asthma





- NUCALA is an interleukin 5 (IL-5) antagonist (IgG1 kappa)
- NUCALA binds to IL-5 and blocks its binding to the alpha chain of the IL-5 receptor complex on the eosinophil cell surface
 - This inhibits IL-5 signaling and reduces the production and survival of eosinophils

NUCALA reduced blood eosinophil level by 74% within 48 hours^{1*}

Results are descriptive. The clinical significance of these



^{*} Data based on mepolizumab IV 75 mg (n=10) at first measurement post-dose from a phase 2 study in 70 adult patients with asthma and blood eosinophil counts ≥200 cells/µL (mean baseline blood eosinophils: 348 cells/µL).12 Blood eosinophil reduction data based on geometric mean. IV/=intravenous

IV=intravenous.

References: 1. Data on file, GSK. 2. Pouliquen IJ, et al. Int J Clin Pharmacol Ther. 2015;53(12):1015-1027.

So how does NUCALA work?

NUCALA binds to the IL-5 and prevents it from binding to the alpha chain of the IL-5 receptor complex on the eosinophil. This inhibits IL-5 signals and eosinophil production and survival, which is what was seen in a phase 2 study with the first injection of NUCALA: a 74% reduction of eosinophils within 48 hours.

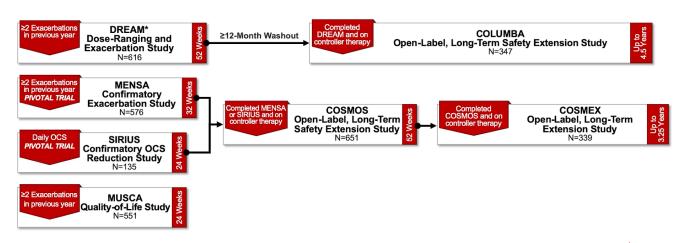
Now let's look at the clinical trial data.





Overview of Comprehensive Phase 3 Clinical Program With NUCALA¹⁻⁷





^{*} Evaluated mepolizumab IV (75, 250, or 750 mg).

References: 1. Pavord ID, et al. Lancet. 2012;380(9842):651-659. 2. Ortega HG, et al. N Engl J Med. 2014;371(13):1198-1207. 3. Chupp GL, et al. Lancet Respir Med. 2017;5(5):390-400. 4. Bel EH, et al. N Engl J Med. 2014;371(13):1189-1197. 5. Lugogo N, et al. Clin Ther. 2016;38(9):2058-2070. 6. Khatri S, et al. J Allergy Clin Immunol. 2019;143(5):1742-1751. 7. Data on file, GSK.



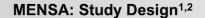
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As you can see, there's a robust phase 3 program for NUCALA: Confirmatory Exacerbations and Oral Corticosteroid Reduction studies, a quality-of-life study, and multiple open label long-term studies.

Today we're going to look at three of these — MENSA, SIRIUS, and COSMOS — that focus on exacerbations and steroid reduction and safety, and, therefore, are very relevant to our patient, Sarah.













Select Inclusion Criteria

- Blood eosinophil count ≥150 cells/µL at baseline or ≥300 cells/µL within the last 12 months
 ≥2 exacerbations* in previous year
 Patients aged ≥12 years



Background Therapy

High-dose ICS[†] plus an additional controller(s) with or without OCS



Treatment Arms (every 4 weeks)

- Mepolizumab 75 mg IV + placebo SC
 NUCALA 100 mg SC + placebo IV
 Placebo IV + placebo SC

All patients remained on their existing maintenance asthma therapy standard of care (SOC) throughout the trial.

* Defined as worsening of asthma that required use of oral/systemic corticosteroids and/or hospitalization and/or ED visits; for patients on maintenance oral/systemic corticosteroids, exacerbations were defined as requiring at least double the existing maintenance dose for ≥3 days. † Defined as ≥880 µg of FP, or the equivalent, per day in patients aged ≥18 years, and ≥440 µg of FP, or the equivalent, per day in patients aged 12-17.



References: 1. Ortega HG, et al. N Engl J Med. 2014;371(13):1198-1207. 2. Data on file, GSK.

With MENSA, the question we are looking at is: can NUCALA reduce the amount of exacerbations in patients with severe eosinophilic asthma who had two or more exacerbations in the last year, despite high-dose traditional inhaled therapy and an eosinophil count equal to or greater than 150 cells/µL?

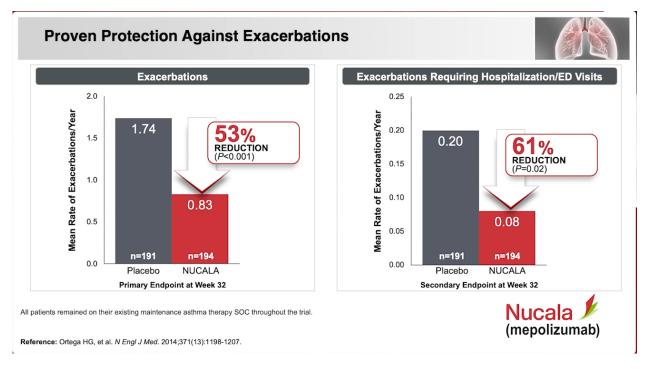
Recall that our patient Sarah had a blood eosinophil count of 190 cells/µL and a historical count of 390 cells/µL one year ago.

Patients in this study were randomized to receive the currently approved dose of NUCALA, 100 mg subcutaneous, or mepolizumab 75 mg IV, or placebo. All therapies were added to the standard of care.

So, let's look at the results.





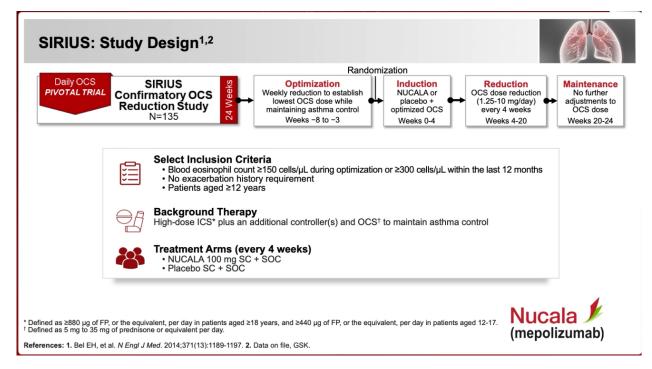


As you can see, with NUCALA there was a 53% reduction in exacerbations as well as a 61% reduction in exacerbations requiring hospitalizations vs. placebo. A significant reduction for these patients with frequent exacerbations

Next, the SIRIUS study looked at reduction in oral corticosteroids.







This was the same type of patient population with elevated eosinophils. But notice, there was no requirement for exacerbation history. They were on a high-dose maintenance traditional therapy along with oral corticosteroid to maintain control of their asthma.

The nice thing about this study is that investigators went through an optimization period. Patients were brought down to the lowest possible level of oral corticosteroids to keep their asthma well controlled, to truly reflect the benefit of NUCALA in reducing their oral corticosteroid dose.

Patients were then randomized to receive NUCALA or placebo as add-on therapy, then oral corticosteroids was reduced according to a reduction protocol and maintained at that dose.

Again, potentially good news for our patients such as Sarah.

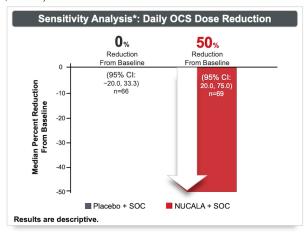




Proven Reduction in OCS Dose



Patients treated with NUCALA achieved significantly greater reductions in daily OCS dose, while maintaining asthma control, compared with placebo (primary endpoint, *P*=0.008).





Reference: Bel EH, et al. N Engl J Med. 2014;371(13):1189-1197.

We see a powerful reduction in the OCS dose while maintaining asthma control.

More specifically, in a sensitivity analysis to this endpoint, there was a 50% median reduction from baseline compared to a 0% reduction for placebo.



IMPORTANT SAFETY INFORMATION (Cont.)

ADVERSE REACTIONS

MOST COMMON ADVERSE REACTIONS WITH NUCALA WITH ≥3% INCIDENCE AND MORE COMMON THAN PLACEBO REPORTED IN THE FIRST 24 WEEKS OF TRIAL 2 (MENSA) AND TRIAL 3 (SIRIUS)

		-
Adverse Reaction	NUCALA (n=263), %	Placebo (n=257), %
Headache	19	18
Injection site reaction	8	3
Back pain	5	4
Fatigue	5	4
Influenza	3	2
Urinary tract infection	3	2
Abdominal pain upper	3	2
Pruritus	3	2
Eczema	3	<1
Muscle spasms	3	<1

Systemic Reactions, including Hypersensitivity Reactions: In 3 clinical trials, the percentages of subjects who experienced systemic (allergic and nonallergic) reactions were 3% for NUCALA and 5% for placebo. Manifestations included rash, flushing, pruritus, headache, and myalgia. A majority of the systemic reactions were experienced on the day of dosing.

Injection site reactions (eg. pain, erythema, swelling, itching, burning sensation) occurred in subjects treated with NUCALA.



Please see Important Safety Information for NUCALA throughout this video.
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^{*} Sensitivity analysis to the primary endpoint.





The most common adverse reactions with NUCALA with incidence of 3% or more and more common than placebo reported in the first 24 weeks of MENSA and SIRIUS are shown in this table and included: headache, injection site reaction, back pain, fatigue, influenza, urinary tract infection, upper abdominal pain, pruritus, eczema, and muscle spasms.

In 3 clinical trials, 3% of subjects who received NUCALA experienced systemic (allergic and nonallergic) reactions, compared to 5% in the placebo group. Note that this includes patients experiencing systemic reactions, including injection site reactions. Other manifestations included rash, flushing, pruritus, headache, and myalgia, and a majority of these were experienced on the day of dosing.

Let's look at Use in Specific Populations.



IMPORTANT SAFETY INFORMATION (cont.)

USE IN SPECIFIC POPULATIONS

- A pregnancy exposure registry monitors pregnancy outcomes in women exposed to NUCALA during pregnancy. To enroll call 1-877-311-8972 or visit www.mothertobaby.org/asthma.
- The data on pregnancy exposures are insufficient to inform on drug-associated risk. Monoclonal
 antibodies, such as mepolizumab, are transported across the placenta in a linear fashion as the
 pregnancy progresses; therefore, potential effects on a fetus are likely to be greater during the second
 and third trimesters.



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Pregnant women were excluded from the studies, and women of childbearing age were required to use effective birth control.

Keep in mind that monoclonal antibodies do cross the placenta, particularly in the second and third trimester.

If you have patients who become pregnant while taking NUCALA or after she stops taking NUCALA, please consider enrolling her into this mothertobaby.org website so that the third party administrating this observational study can gather safety information that may be useful to future patients receiving NUCALA.





COSMOS Long-Term Data: Study Design¹⁻⁴

Open-Label Extension



COSMOS Open-Label, Long-Term Safety Extension Study N=651





Treatment Arms (every 4 weeks)

NUCALA 100 mg SC + SOC

References: 1. Ortega HG, et al. *N Engl J Med.* 2014;371(13):1198-1207. **2.** Bel EH, et al. *N Engl J Med.* 2014;371(13):1189-1197. **3.** Lugogo N, et al. *Clin Ther.* 2016;38(9):2058-2070. **4.** Data on file, GSK.

Next, let's look at COSMOS, an open-label, extension study to MENSA and SIRIUS about long-term safety.

^{*} Worsening or exacerbation of asthma.

[†] Worsening of asthma that required use of oral/systemic corticosteroids and/or hospitalization and/or ED visits; for patients on maintenance oral/systemic corticosteroids, exacerbations were defined as requiring at least double the existing maintenance dose for ≥3 days.

AE=adverse event.





COSMOS Long-Term Data: Study Design¹⁻⁴

Open-Label Extension



Primary Safety Results

Most frequent AEs (≥10%): nasopharyngitis, 30%; URTI, 16%; asthma*, 14%; headache, 14%; bronchitis, 12%; sinusitis, 10%

Serious AEs: 14% of all patients reported serious AEs; one serious AE occurred in ≥1% of participants: asthma*, 6%

Systemic reactions and injection site reactions: systemic reactions, 2%; injection site reactions, 4%

AEs (3% to <10%): back pain, arthralgia, oropharyngeal pain, injection site reaction, influenza, nausea, cough, lower respiratory tract infection, fatigue, rhinitis, diarrhea, urinary tract infection, musculoskeletal pain, pain in extremity, dizziness, myalgia, gastroenteritis, and pyrexia

Herpes zoster: 2 events of herpes zoster, 0 reported as a serious AE

Annualized Exacerbation[†] **Rates:** 0.99 for previous placebo group (95% CI: 0.83, 1.18) vs 0.90 for previous mepolizumab group (95% CI: 0.78, 1.04). Results are descriptive.

References: 1. Ortega HG, et al. *N Engl J Med.* 2014;371(13):1198-1207. **2.** Bel EH, et al. *N Engl J Med.* 2014;371(13):1189-1197. **3.** Lugogo N, et al. *Clin Ther.* 2016;38(9):2058-2070. **4.** Data on file, GSK.

The most common adverse events reported included nasopharyngitis, headache, and some sinus issues.

Note that worsening asthma was among the reported serious adverse events.

The study showed that the side effect profile in the long-term is similar to that seen in controlled studies.

What about long-term durability of reduction in steroids?

^{*} Worsening or exacerbation of asthma.

[†] Worsening of asthma that required use of oral/systemic corticosteroids and/or hospitalization and/or ED visits; for patients on maintenance oral/systemic corticosteroids, exacerbations were defined as requiring at least double the existing maintenance dose for ≥3 days.

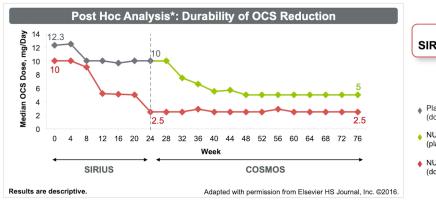
AE=adverse event.





Lasting Reduced OCS Dose Observed for an Additional 52 Weeks





93% of patients from SIRIUS enrolled in COSMOS

- Placebo + SOC (double blind), n = 58
- NUCALA + SOC (placebo in double blind), n = 58
- NUCALA + SOC (double blind and open label), n = 57



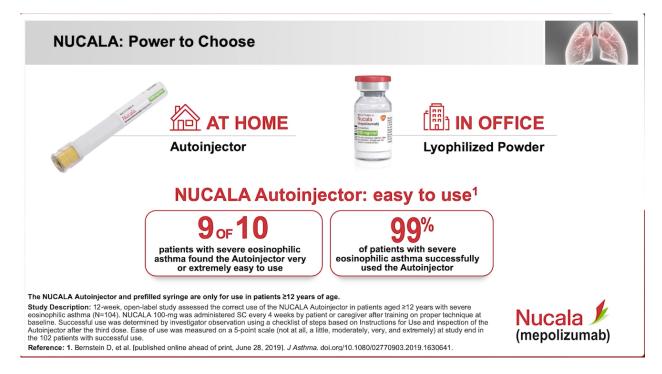
Durability of response was defined as OCS dose reduction when combined with SIRIUS data.

If we look at the original study, SIRIUS and then COSMOS, this post hoc analysis showed sustained durability of the reduction in oral corticosteroids for an additional 52 weeks for patients previously on NUCALA. You can also see that those previously on placebo were then able to reduce their steroid dose once switched to NUCALA.

^{*} Graph only includes patients who completed COSMOS. Reference: Lugogo N, et al. Clin Ther. 2016;38(9):2058-2070.







The availability of NUCALA Autoinjector for at-home administration gives us and our appropriate patients the choice of which route of administration is best for them.

In the clinical study, almost all of the patients found the Autoinjector very or extremely easy to use and demonstrated successful administration. Of course, keep in mind the need for close follow up for those patients who use home injections — they have severe asthma after all.

How many of our patients would love the option of fewer injection visits and at-home administration? Well, NUCALA Autoinjector may offer that.





Prescribe NUCALA With Confidence for Severe Eosinophilic Asthma¹⁻³









*MENSA (Trial 2): 53% reduction vs placebo (0.83/year vs 1.74/year respectively; P<0.001).

†COLUMBA: 4.5-year open-label study assessing the safety, immunogenicity, and efficacy of NUCALA 100 mg added to asthma controller therapy in 347 patients with severe eosinophilic asthma.

References: 1. Ortega HG, et al. N Engl J Med. 2014;371(13):1198-1207. 2. Bel EH, et al. N Engl J Med. 2014;371(13):1189-1197.

3. Khatri S, et al. J Allergy Clin Immunol. 2019;143(5):1742-1751.



So, in summary, good news for our appropriate patients. Now, we have long-term data and experience with NUCALA, a medication that works on the IL-5 eosinophil pathway, that offers protection against exacerbations and significantly reduces the use of chronic oral steroids.

It allows patients improved exacerbation control, affords more flexibility in administration and hope for long-term efficacy and stability.

Thank you.

Please see Important Safety Information throughout this transcript.

Please see full <u>Prescribing Information</u> and <u>Patient Information</u> for NUCALA in the related material section on the website, or visit <u>NucalaHCP.com</u>.

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