

Forward-looking statements

Statements in this presentation that are not purely historical in nature are "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995. Forward-looking statements in this presentation include, without limitation, statements regarding: the design and potential benefits of *neffy*, including the likelihood allergy patients and caregivers will choose to carry and dose *neffy* compared to needle-bearing options; ARS Pharma's expected competitive position; the potential market. demand and expansion opportunities for neffy; the anticipated timing for approval of the supplemental regulatory application for 1 mg neffy dose for children 15 kg to 30 kg; the timeline for commercialization of neffy outside of the United States; the timing for potential foreign regulatory filings in, for example, China, Japan, Australia and Canada; the timing of data from the Phase 2b randomized placebo-controlled urticaria trial and initiation of a single pivotal study in urticaria; ARS Pharma's marketing and commercialization strategies; the expected composition and reach of ARS Pharma's commercial force; the potential for the neffy Experience Program; the availability and functionality of neffyconnect; the anticipated pricing and co-pay buydown; the likelihood of neffy attaining favorable coverage and the expected timing of coverage decisions; the timing and expected percentage of commercial coverage with unrestricted access; ARS Pharma's projected operating runway; the expected intellectual property protection for neffy; and any statements of assumptions underlying any of the foregoing. These forward-looking statements are subject to the safe harbor provisions under the Private Securities Litigation Reform Act of 1995. Because such statements are subject to risks and uncertainties, actual results may differ materially from those expressed or implied by such forward-looking statements. Words such as "anticipate," "demonstrate," "expect," "indicate," "plan," "potential," "target," "will" and similar expressions are intended to identify forward-looking statements. These forward-looking statements are based upon ARS Pharma's current expectations and involve assumptions that may never materialize or may prove to be incorrect. Actual results and the timing of events could differ materially from those anticipated in such forward-looking statements as a result of various risks and uncertainties, which include, without limitation: the ability to maintain regulatory approval for neffy; results from clinical trials and non-clinical studies may not be indicative of results that may be observed in the future; potential safety and other complications from neffy; the labeling for neffy in any future indication or patient population; the scope, progress and expansion of developing and commercializing neffy; the potential for payors and governments to delay, limit or deny coverage or reimbursements for neffy; the size and growth of the market therefor and the rate and degree of market acceptance thereof vis-à-vis intramuscular injectable products; ARS Pharma's ability to protect its intellectual property position; and the impact of government laws and regulations. Additional risks and uncertainties that could cause actual outcomes and results to differ materially from those contemplated by the forward-looking statements are included under the caption "Risk Factors" in ARS Pharma's Quarterly Report on Form 10-Q for the quarter ended September 30, 2024, filed with the Securities and Exchange Commission ("SEC") on November 13, 2024. This and other documents ARS Pharma files with the SEC can also be accessed on ARS Pharma's website at ir.ars-pharma.com by clicking on the link "Financials & Filings" under the "Investors & Media" tab.

The forward-looking statements included in this presentation are made only as of the date hereof. ARS Pharma assumes no obligation and does not intend to update these forward-looking statements, except as required by law.





neffy® (epinephrine nasal spray)

NOW APPROVED!

INDICATION

neffy is indicated for the emergency treatment of allergic reactions (Type I), including anaphylaxis, in adults and children who weigh ≥ 30kg







Potential to Transform the Treatment of Type I Allergic Reactions

- neffy®: first and only FDA and EC approved "no needle, no injection" solution for Type I allergic reactions to address an unmet market need by eliminating needle-related safety risks, and reducing fear and hesitation that leads to delays in treatment
- Significant opportunity to disrupt current epinephrine injectables market, where patients are highly dissatisfied with current options, and the market is highly underpenetrated
- Potential multi-billion US market opportunity driven by HCP and consumer preference and adoption
- NCE-like IP exclusivity potential with issued composition of matter and method of treatment patents until at least 2038
- \$204.6 million in cash and short-term investments as of 9/30/2024, which excludes \$145 million received from ALK in November 2024



Anaphylaxis is Accompanied by Many Frequent Symptoms

Common Anaphylaxis Symptoms Include:

>85% urticaria (hives, erythema) or angioedema (swelling of the face, lips, tongue or larynx)

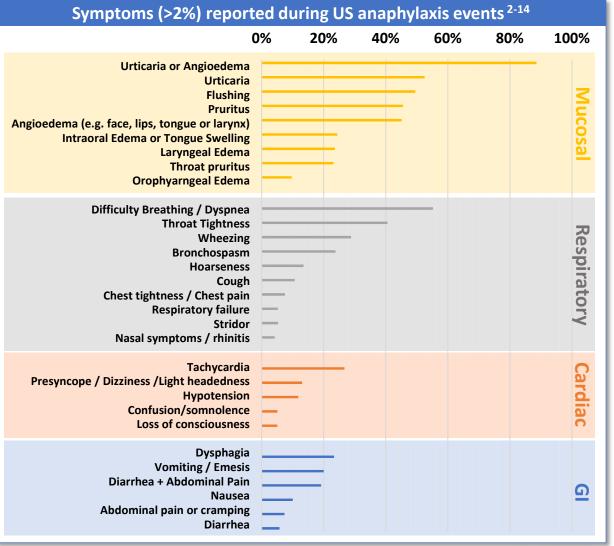
>55% difficult breathing

>40% gastrointestinal (eg, vomiting, nausea)







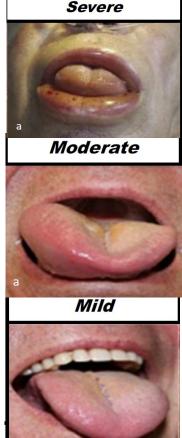




Presentation of anaphylaxis is unpredictable in terms of rate of progression, observed symptoms and symptom severity - a novel product must be effective for the full spectrum of anaphylaxis

Severity grades* "Signs and ANY Severe: symptoms of Cardiovascular, Neurologic, Respiratory anaphylaxis are unpredictable **ANY Moderate:** and may vary Cardiovascular, Neurologic, Respiratory from patient to Severe: Mucosal/angioedema patient and from one reaction to **ANY Mild:** another."2 Cardiovascular, Neurologic, Respiratory 2 or more Mild, ANY Moderate: Skin, Gastrointestinal, Mucosal/angioedema **ANY Mild:** Skin, Gastrointestinal, Mucosal/angioedema

Mucosal/Angioedema Visual Presentation Severity of Mucosal/Angioedema Involvement¹



Like injection, any novel epinephrine product must be delivered safely and effectively irrespective of the severity across the full continuum of anaphylaxis including symptoms such as angioedema, loss of consciousness (passerby doses) or during vomiting



Type I Allergy Patients Face Significant Limitations with Current Treatment Options that *neffy* may help to address

PROBLEM:

ONLY 10% - 20% of patients with active Rx use as indicated⁷



REFUSAL OF TREATMENT

DELAY IN TREATMENT

USER ERROR IN TREATMENT

Only 50% carry one¹
(<20% carry two)

~25% - 60% do not administer 1,3 5, 6

~40% - 60% of patients delay²

23% - 35% fail to dose correctly⁴

SOLUTION:



SMALL

- Fits in your pocket; easy to carry the recommended 2 devices
- ~10% of cases require repeat doses of epinephrine¹

NO NEEDLE NO INJECTION

- Rapid administration without a needle
- No risk of needle-related injuries; lacerations² or cardiotoxic blood vessel injections
- Less hesitation to dose

EASIER AND MORE CONSISTENT DOSING

- Simple place and press administration (no hold time)
- 100% of adults and children dosed *neffy* successfully in human factors studies by reading the commercial instructions for use (IFU)

RELIABLE

- 99.999% delivery of effective dose in reliability testing; not obstructed by any anaphylaxis symptoms; no inhalation required
- 30-month shelf-life at room temperature, with neffy stored at up to 3 months at high temperatures (122°F)



neffy Designed for Ease of Use and Easy Carry and to Minimize Risk of Side Effects

Relative Size of *neffy* two pack Compared to iPhone 15 and EpiPen



Program Progra

Case holds **two** neffy 2mg devices

Proprietary Intravail technology allows consistent intranasal absorption

High bioavailability at low 2 mg dose minimizes risk of side effects

Well-tolerated with no meaningful pain or irritation

Issued composition of matter and method of treatment patent exclusivity until at least 2038







Registrational studies demonstrate comparability on both PD surrogates for efficacy and PK with *neffy*

III. PD and PK Data

- 2 mg *neffy* met all clinical endpoints
- PD surrogates for efficacy comparable to approved products (SBP/HR ≥ approved injection products)
- Rapid and significant response on PD surrogates for efficacy observed even 1 minute after dosing
- PK bracketed by approved products (exposures
 ≥ IM/SC for efficacy, < EpiPen for safety)
- Repeat doses (including during rhinitis) within range of approved injection products



Safety Data

- Adverse events generally mild in nature with no meaningful nasal irritation or pain up to 4 mg dose
- Most common adverse events (>5%) with single does of *neffy* were mild nasal discomfort (9.7%) and mild headache (6%), with no correlation of nasal discomfort to pain or irritation
 - Mean VAS pain scores between 5 to 8 out of 100
 - No irritation based on formal assessment
- No serious adverse events in any clinical study
- No risk of needle-related injuries or blood vessel injections with neffy



Differentiated FDA label for *neffy* compared to injection may reduce hesitancy to dose and lead to broader adoption

Label differentiation	Injection ¹	neffy	
1. Emergency medical assistance after dosing not automatic, consistent with new AAAAI treatment guidelines	"In conjunction with the administration of epinephrine, the <u>patient should seek</u> immediate medical or hospital care."	"Advise patients when to seek emergency medical assistance for close monitoring of the anaphylactic episode, and in the event further treatment is required."	
	 Accidental IV injection may result in cerebral hemorrhage 	No injection-related warnings or precautions	
2. Removes all injection-related warnings and precautions, which may	 Accidental injection into digits, hands or feet may result in loss of blood flow to the affected area, and immediate visit to emergency room 		
reduce anxiety and hesitation to dose	 Needle-related injury due to lacerations, bent needle and embedded needles 		
	 Serious injection site infections including necrotizing fasciitis and myonecrosis 		
3. Wider temperature stability, which may facilitate carriage and continuous readiness	Excursions permitted from 59°F to 86°F	Excursions permitted from 5°F to 122°F	

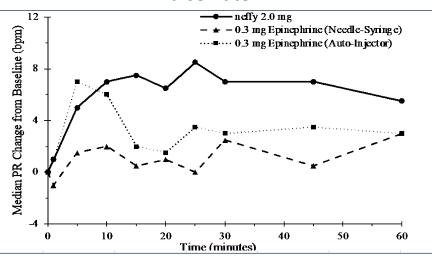


U.S. prescribing information for *neffy*: robust response on PD surrogate markers for efficacy in normal and NAC¹ nasal conditions

Pulse Rate

Systolic Blood Pressure

Figure 1: Median Pulse Rate (PR) and Systolic Blood Pressure (SBP) Change from Baseline Following One Dose of Epinephrine in Healthy Subjects [Study 1]



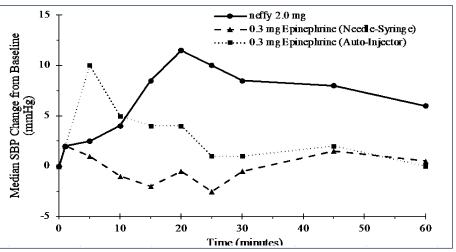
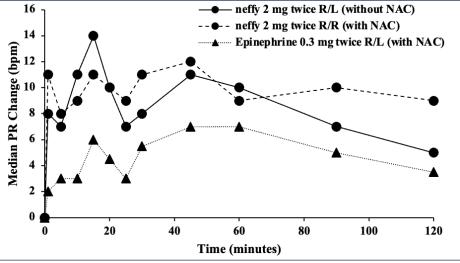
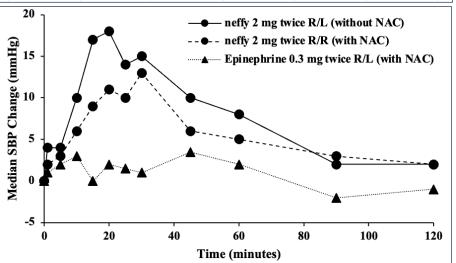


Figure 2: Median Change from Baseline for Systolic Blood Pressure (SBP) and Pulse Rate (PR) Following Two Doses of Epinephrine Administered 10 Minutes Apart in Right and Left Nares (R/L) or Right and Right Nares (R/R) in Subjects with Allergic Rhinitis with and without Nasal Allergen Challenge (NAC) [Study 4]







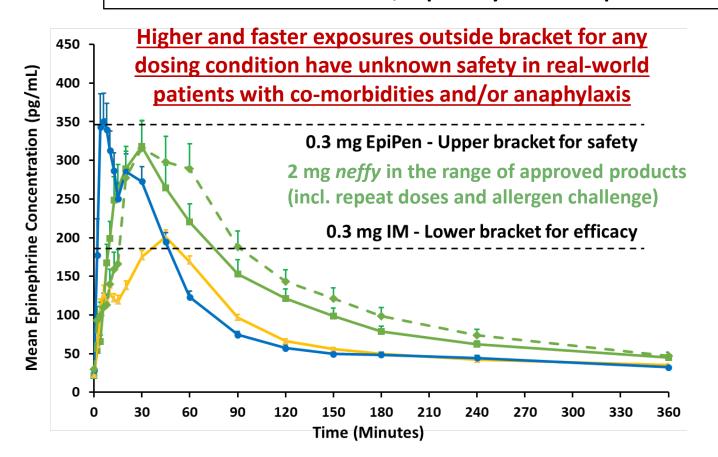
neffy exposures for all dosing conditions are in the range of approved injection exposures that are considered safe enough for use in anaphylaxis given the 35+ years of real-world safety

No difference in efficacy for PK > 0.3 mg IM ($^{\circ}90\%$ resolution with single dose for all injectables⁴), but possible increased risk of side effects, especially if time to peak concentration is faster than autoinjector (e.g. IV bolus)

side effects

risk of

Increased



8 mg by injection = maximum tolerated dose¹ 4 mg by injection = minimally lethal dose¹

0.3 mg EpiPen – risk of cardiotoxicity in healthy subject with accidental IV bolus (tmax = 4 min) 103 mmHg increase in systolic blood pressure²

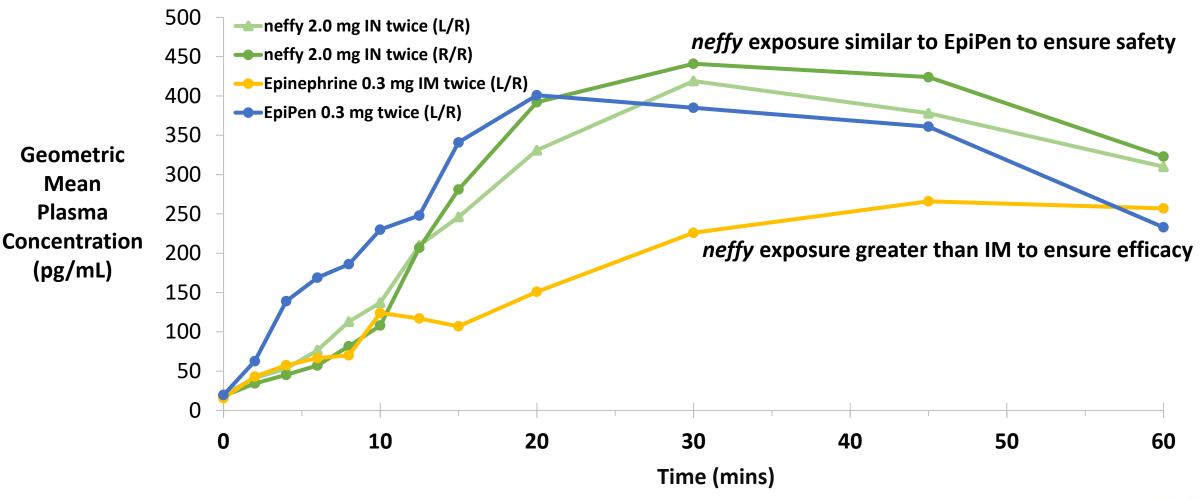
0.3 mg IM – higher risk of cardiotoxicity in older patients with more comorbidities³

Results: Among 338 included patients, 16 (4.7%; 95%CI: 2.8–7.6%) experienced cardiotoxicity. Cardiotoxic events included eight (2.4%) ischemic electrocardiogram changes, six (1.8%) episodes of elevated troponin, five (1.5%) atrial arrhythmias, one (0.3%) ventricular arrythmia, and one (0.3%) depressed ejection fraction. Patients with cardiotoxicity were significantly older, had more comorbidities, and were more likely to have received multiple doses of epinephrine or an epinephrine infusion compared with a single IM dose of epinephrine.



Exposures of repeat doses of *neffy* in healthy subjects are also in the range of FDA approved epinephrine injection products

Repeat-dosing (10 min apart) results in healthy subjects





neffy has been designed to uniquely treat anaphylaxis effectively and safely in a portable and needle-free format

	Consideration for Use in Anaphylaxis	neffy features
6000	Are exposures in the range of injection products already established to be safe through real-world historical use even in patients with co-morbidities, anaphylaxis or cardiovascular disease, and for all relevant dosing conditions?	neffy exposures are within range of injection products including repeat dosing and nasal allergen challenge, with variability similar to or less than injection products, which minimizes chance of outliers that are either too high or too low
	Is the epinephrine dose low to minimize risk of overdose given established therapeutic window of epinephrine, especially in older patients or those with co-morbidities?	neffy achieves injection-like PK with a high bioavailability low 2 mg dose, within the known therapeutic window of epinephrine
· · · · · · · · · · · · · · · · · · ·	Is the absorption profile or ability to use the product negatively impacted by co-occurring anaphylaxis symptoms, or disease severity, including GI symptoms (e.g. vomiting), or mucosal changes (tongue swelling, angioedema), that can alter absorption or even obstruct ability to dose?	neffy labelled for effective and safe use across the entire continuum of anaphylaxis disease, irrespective of severity or stage of symptoms, just like the epinephrine injection products that can treat even late-stage disease
	Is there risk of adverse events that could mimic anaphylaxis and prevent effective treatment such as GI symptoms or erythema?	neffy has minimal to no GI symptoms or erythema that could confound effective treatment of the disease by a patient, caregiver or HCP
s	Will patients, especially children, be deterred from use due to side effects or irritation from the product?	neffy shows no meaningful pain or irritation as measured by formal scales that could deter use
	Is the product reliable at delivering epinephrine in an emergency?	neffy uses a 99.999% reliable device that can be administered by caregivers by reading the instructions without any training; the device has even been used to treat unconscious patients (e.g. NARCAN)

ARS Pharmaceuticals, Inc. Investor Presentation – December 2024

Alignment with FDA on post-marketing studies





Filed EPI-10 study for pediatric patients 15 to 30 kg in body weight (1 mg dose)

Accepted for priority review with PDUFA target action date assigned of March 6, 2025



Registry to collect clinical data from allergy challenge clinics (PMC)



Nominal cost and no material impact on operating runway anticipated



Ex-US partners enable exclusive focus on the US, which is ~80% of global epinephrine net sales today at generic injectable prices¹



ALK

Licensing deal with ALK (Europe, Canada, and others)

Upfront: \$145M cash

Milestones: up to \$320M

Royalties: tiered double-digit

~3 billion DKK (~\$425M USD)

neffy annual peak sales in ALK
region for anaphylaxis only²



US launch is the first step to making *neffy* available to more patients worldwide



sNDA for 1 mg dose (15 to 30 kg children) accepted for priority review with PDUFA target action date assigned of March 6, 2025



European Commission (EC) marketing authorization granted in August 2024

MAA for 1 mg dose (15 to 30 kg children) expected in early 2025

Australia, China and Japan MAA filing all expected by November 2024



UK MAA filing expected in December 2024

Canada filing expected in December 2024

Additional filings in other countries expected in 2025



Expansion opportunities

- Phase 2b randomized placebo-controlled trial in CSU patients on antihistamine therapy still experiencing acute exacerbations expected to initiate in early 2025
- Potential single pivotal study in urticaria to initiate after Phase 2b study



Commercialization Strategy



Significant Opportunity to Address Unmet Needs in Current US Severe Allergic Reaction Patient Population



Epidemiology prevalence data estimates ~40M patients with type 1 allergic reactions²⁻⁹



Consistent Market Growth (Units)

+6.5% CAGR since 2010, +12.7% YoY in 2023¹



~20M diagnosed and under physician care over the last 3 years¹⁰



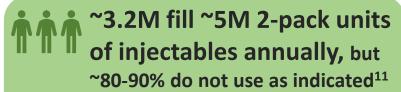
Promotional Responsiveness

~50% increase over market growth trend with consumer promotion (2010 to 2015¹)



6.5M prescribed epinephrine¹⁰

Primarily managed by allergists & pediatricians



- (1) do not carry (~50%), (2) do not inject (25-60%),
- (3) wait (40-60%) or (4) dose incorrectly (23-35%)

Due to limitations of autoinjectors including needle, size and portability

\$710 WAC per 2-pack unit of *neffy*

ተተተተተተተተተተተ

~13.5M Type I diagnosed but not prescribed Rx (past 3 years)¹⁰

Primarily managed by non-allergists and non-pediatricians
Diagnosing HCP not well-educated about treating anaphylaxis

\$710 WAC per 2-pack unit of *nef*

Patients state they may also acquire twice as many *neffy* units vs. injection to provide continuous readiness and peace of mind¹²



Coverage of FDA Approval Highlighted *neffy* as a Breakthrough for **Patients and Caregivers with Severe Allergies**



More than 1.92 million mentions of *neffy* across digital platforms resulting in a reach of 603 billion; ARS content generated 371K impressions and ~100K video views.



Coverage on all morning shows as well as nightly news and Spanish-speaking networks



Covered by key wire services, top-tier business, consumer and trade media outlets featuring key messages as well as insights from physicians and patients



Local media coverage on 700+ TV, online and print outlets across the U.S including all major cities



Patient advocacy groups supported approval and shared across communications platforms to inform members





















The Washington Post











ARS Pharmaceuticals, Inc. Investor Presentation – Decer

neffy can address the unmet need and is aligned with what patients and parents want¹





88%

OF PATIENTS LIKELY TO VERY LIKELY TO ASK THEIR PHYSICIAN ABOUT neffy Rx¹

89%

OF NON-FILLING PATIENTS
STATED THEY WOULD ASK THEIR
PHYSICIAN ABOUT neffy RX¹



72% OF THE TIME,

PEOPLE WHO
USE AN OTC WOULD
USE *neffy* FIRST²

81%
OF PEOPLE
WOULD USE neffy

SOONER THAN CURRENT
NEEDLE INJECTORS³



HCPs Indicate Substantial Opportunity to Convert and Grow Market May 2024 ATU, Sample = 202 HCPs





87%

How Likely Would You Be to Prescribe *neffy*Upon Availability?*
*Would Prescribe to Definitely Prescribe

66%

What % of the Time Would You Offer *neffy* to Your Patients that Currently Fill an Injectable Rx?

70%

Anticipated % of Patients that Don't Fill or Re-Fill Injectables with an active *neffy* Rx at One Year

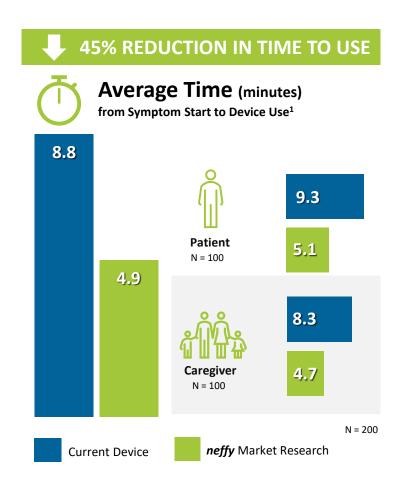


neffy: Innovative Treatment to Overcome Known Challenges with Needle-Injectors for SAR Patients

Benefits of needle-free alternative to address major unmet needs

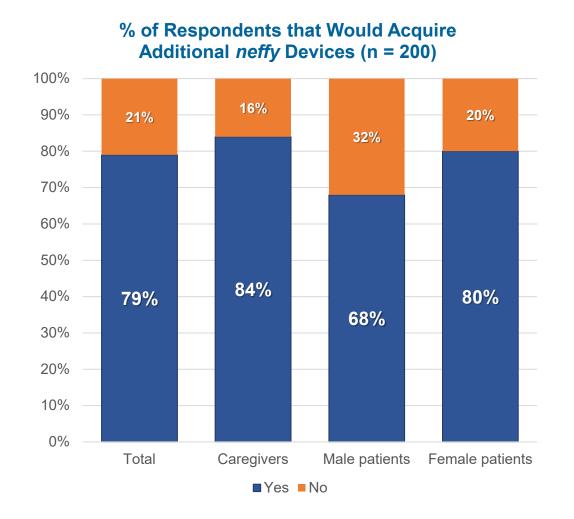
- More allergy patients and caregivers are likely to carry *neffy* compared to current needle-bearing options³
- Patients are likely to dose neffy more rapidly with a needle-free device¹

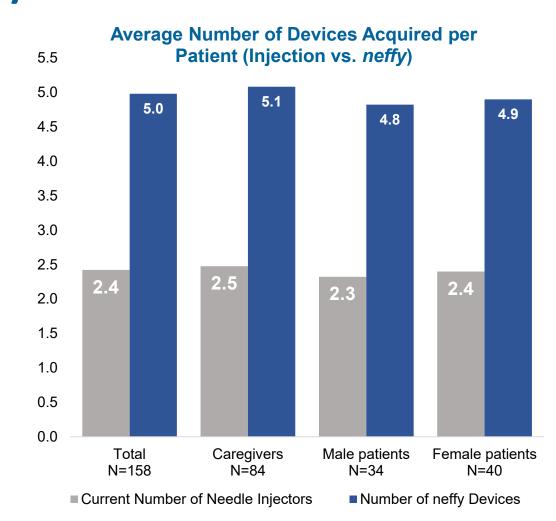






Nearly 80% of respondents indicate they would acquire additional *neffy* when available, averaging a potential of 2.6 additional devices more than they have now







ARS Pharmaceuticals, Inc. Investor Presentation – December 20

neffy Strategic Objectives for Commercialization







EDUCATE PRESCRIBERS

Drive adoption within specialty and high decile prescribers on the compelling value-proposition of *neffy*



FACILITATE ACCESS

neffy access, affordability and support services



ACTIVATE PATIENTS

Create awareness and motivate patients and caregivers to seek *neffy*





Drive adoption within specialty and high decile prescribers

Healthcare Provider Launch Objectives

- Commercial force of 118 Sales and Virtual Representatives and Area Sales Managers
- Calling on 12,500 Allergy Specialists and High Decile Prescribers
 - Reaching 40-45% of Prescriptions from all HCPs
 - Reaching >80% of Prescriptions from Allergists and Pediatricians
- Deployed in the field in early October
 - 5,700 targets visited as of Nov 7, 2024
 - 1,700 targets have already prescribed
- Education, awareness, and resources to drive adoption (*neffy* Experience)





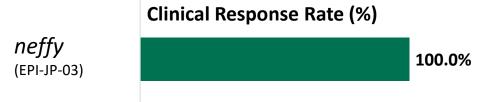


Strong demand for *neffy* experience program – *neffy* shipped to more than 1000+ healthcare provider offices

neffy Experience Program (rescue therapy at allergy challenge clinics)

- Enable real-world experience with neffy
- Target allergist offices that conduct inoffice food challenge testing
- HCPs will have the ability to gain firsthand knowledge of neffy's effectiveness

 <u>Patients</u> undergoing allergy challenge will also be exposed to *neffy* Efficacy Study of *neffy* in Oral Food Challenge Induced Anaphylaxis (EPI-JP-03, n = 15 pediatric subjects)¹



100% of patients responded to a single dose of *neffy* in the first 15 minutes, and did not require a second dose of epinephrine per treatment guidelines

100% of patients experienced complete resolution of the anaphylaxis symptoms with single dose of *neffy*²

16 min median time to complete resolution of anaphylaxis following single dose of *neffy*





Committed to ensuring *neffy* access for all patients

Payer discussions on track for commercial coverage targets

- 60%+ coverage anticipated by 6 months post-launch (end of Q1 2025)
- 80%+ coverage anticipated by 12 months post-launch (end of Q3 2025)

Contract discussions with key payers ongoing, including all three major group purchasing organizations, with initial coverage decisions expected by year end

ACCESS & AFFORDABILITY

ARS believes that affordability should never prevent access: *neffy*connect was developed to deliver on that commitment

Cash price for two doses of *neffy* is \$199

SUPPORT

ARS is committed to the SAR community of patients, caregivers, advocates, and physicians – co-pay buy-down to \$25 for commercial patients, and patient assistance program



ARS Pharmaceuticals, Inc. Investor Presentation – December 202

neffy US payer coverage update as of Dec 5, 2024

- neffy has been added to Express Scripts' commercial national formularies
- Express Scripts is the second largest pharmacy benefit manager based on market share of retail prescriptions¹
- Coverage for eligible patients is effective as of November 22, 2024





neffy profile supports strong value-proposition, and offers potential savings to patients and payers

INNOVATION

ARS is proud to bring an innovative treatment option to the marketplace that provides freedom and peace of mind by enabling patients to dose at first sign of allergic symptoms

SUPPORT

ARS is committed to the SAR community of patients, caregivers, advocates, and physicians – co-pay buy-down to \$25 for commercial patients, and patient assistance program

ACCESS & AFFORDABILITY

ARS believes that affordability should never prevent access: **neffy**connect was developed to deliver on that commitment **Cash price for two doses of neffy** is \$199

RAPID & BROAD UNRESTRICTED FORMULARY COVERAGE

anticipated given high degree of interest in *neffy*, positive receptivity in early conversations, strong value proposition vs. competition, and programs to support formulary exceptions

	neffy	Branded IM Injection	Generic IM Injection
Patient Co-Pay – most insured	\$25	\$35 ¹	Avg \$40
Cash Price - uninsured	\$199	\$150-\$289 ¹	\$111-\$272
Product expiration (up to)	30 months	~18 to 24 months	~18 to 24 months
Average Patient Cost Per Month (Co-Pay or Cash Price/Shelf Life)	\$0.83 / \$6.63	\$1.94 / \$12.19	\$2.22 / \$10.63 (average)



neffy profile including 30-month shelf-life may increase market opportunity within current active Rx patient segment

	neffy	needle-injectors
Shelf-life (up to)	30 months	~18 to 24 months
Time between refills	18 months (patient market research) ¹	15 months (IQVIA longitudinal data) ²
Preference share	~15 absolute % point increase in patient preference share vs. 18-month shelf-life ¹	
Cartons* per refill cycle	Greater than 2 cartons/cycle ¹	1.2 to 1.4 cartons/cycle ²
Likelihood to use device 72% would use <i>neffy</i> instead of OTC antihistamine prior to autoinjector ³ 45% reduction in time to use vs. autoinjector ⁴		

Anticipate strong volume growth among today's active Rx patient segment, in addition to lapsed/non-filler and untreated patient segments



*One carton contains two devices



Create awareness & motivate to seek neffy

Consumer Launch Objectives

- Drive awareness & motivate patients to request *neffy* by name
- Enable patients and caregivers to feel fully empowered to act during a potential crisis moment
- Activate patients and caregivers to share their *neffy* story to encourage peer uptake





neffy Shows Robust and Rapid Clinical Responses in Treatment-Resistant Urticaria; Phase 2b outpatient study to initiate in 2025



~2M diagnosed chronic urticaria patients based on 12 month US prevalence of 0.78%¹

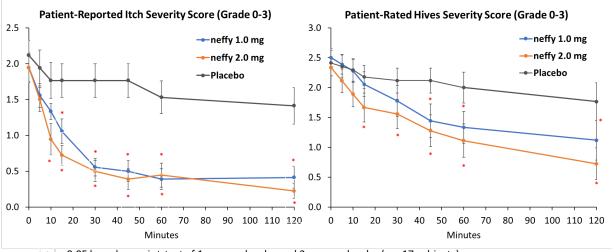


~1M US chronic urticaria patients reported to be treated with Rx medication¹

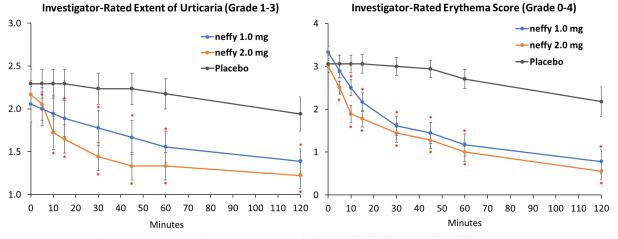
~8-9 HCP visits per year¹
~4-5 ER visits per year^{1,2}
~50% with angioedema,
~7-8 episodes per year³

Significant peak sales opportunity

neffy may provide
episodic relief of acute
flares to improve quality
of life without escalating
to chronic use of systemic
biologics with potentially
more side effects or
having to visit ER/hospital



p<0.05 based on pair t-test of 1 mg vs. placebo and 2 mg vs. placebo (n = 17 subjects)</p>



p<0.05 based on pair t-test of 1 mg vs. placebo and 2 mg vs. placebo (n = 17 subjects)</p>



ARS in 2024 and beyond



neffy[®] in type I allergies

- Q1 2025: anticipated approval for 1 mg neffy (15 to 30 kg) sNDA
- Q1 2025: anticipate 60%+ commercial coverage with unrestricted access
- Q3 2025: anticipate 80% commercial coverage with unrestricted access

Global opportunity and pipeline

- By YE2024: expect filings in UK, Canada, China, Japan and Australia
- Early 2025: expect initiation of Phase 2b study for treating acute urticaria exacerbations in CSU patients on antihistamine therapy

Solid company fundamentals

- Strong balance sheet of \$204.6M on 9/30/2024, which excludes \$145M received from ALK in November 2024 ¹
- Expected operating runway of at least
 3 years to support US commercialization
- Robust composition of matter and method of treatment IP protection through at least 2038

