This is the first systematic

and defining, diagnosing, and

population for which there is no

Meth-APAH is expected to aid in

improve clinical outcomes as well

The heterogeneity of Meth-APAH

and the wider PAH patient

patient-related factors.

population causes difficulty in

defining and characterizing this

under-recognized PAH subtype.

Methamphetamine user types

The definition of Meth-APAH

exclusion of other etiologies.

**Meth-APAH** regardless of

regional prevalence of

patients with IPAH.

methamphetamine use.

should be screened for

should consider factors such as

duration, frequency, and/or dose

of methamphetamine use and the

All patients presenting with PAH

Patients with Meth-APAH can be

Patients with Meth-APAH should

consistently be included as part

information regarding treatment

and disease management within

of clinical trials to generate

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this patient population.

treated according to the same

guidelines recommended for

impact disease-, treatment-, and

the quicker identification and

individualized management of

patients with Meth-APAH to

treating this unique patient

standardized guidance.

as raising awareness.

Conclusions

The characterization of

approach to setting standards for

Key takeaway

# Expert consensus on the definition of methamphetamineassociated pulmonary arterial hypertension (Meth-APAH) and associated treatment considerations

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# Background

- Methamphetamine use can result in methamphetamine-associated pulmonary arterial hypertension (Meth-APAH). Compared with idiopathic PAH (IPAH), Meth-APAH may have a worse clinical course.1
- Meth-APAH is a growing concern due to the exponential increase in methamphetamine use across the United States (US).<sup>2,3</sup>
- Furthermore, patients with Meth-APAH have typically been associated with lower socioeconomic status (SES), education levels, income, and employment rates than those with IPAH.<sup>4</sup> Despite the growing prevalence of Meth-APAH and methamphetamine use, the approach to treating patients with Meth-APAH is varied. A systematic approach is required as Meth-APAH becomes more widespread.

# Objective

To collate, clarify, and develop a consensus of expert clinical opinion on the definition and classification of Meth-APAH and the impact of methamphetamine use on treatment considerations.

# Methods

 A modified Delphi panel involving two survey rounds followed by a final consensus meeting was conducted with clinical experts.

## **Modified Delphi panel process**

## Inclusion criteria

- ✓ US-based physicians specializing in cardiology or pulmonology
- ✓ Actively managing patients with Meth-APAH

Invitation of clinical experts (N=12) to join a modified Delphi panel

**Delphi panel round 1:** Online questionnaire (N=12)

Analysis of Delphi panel round 1 results

**Delphi panel round 2:** Online questionnaire (N=12)

Analysis of Delphi panel round 2 results

## **Delphi panel round 3:** Consensus meeting (N=10)

 A nine-point Likert scale (from 1 [strongly disagree] to 9 [strongly agree]) was used to rate consensus.

Nashville, TN, USA; June 26–28, 2025

# Results

#### **Panelist characteristics**

Criteria		N
US-based physicians		12
Mean number of patients with PAH in a 3-month period		~50
Specialty area	Cardiology	1
	Pulmonology	11
Type of practice	Center of Comprehensive Care	6
	Academic Medical Center	5
	Private practice	1

PAH, pulmonary arterial hypertension

#### **Definition and characteristics of Meth-APAH**

- The panel discussed whether Meth-APAH can be defined as World Health Organization Group 1 PAH in a patient with a history of methamphetamine use; however, a consensus in agreement was not reached.
- Panelists felt that additional details needed to be incorporated, e.g, the definition of Meth-APAH should specify duration, dosage, and/or frequency of methamphetamine use. However, parameters for these vary due to the heterogeneity of the patient population.
- The panel further explained that the definition of Meth-APAH should incorporate the exclusion of other etiologies.



A consensus was reached that Meth-APAH can occur in any age group, but it is most often seen among those aged 21-60 years.



While most patients with Meth-APAH were reported to have a lower SES, Meth-APAH can occur in patients of any SES.

Factors impacted by methamphetamine user types (current, short-term abstinent, long-term abstinent)



Treatment escalation



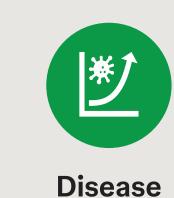
to therapy

Access to a range of therapies or advanced therapies

• The timeframes that define methamphetamine user types are not well established and lack precision.

## **Meth-APAH versus IPAH**

• The panel agreed that Meth-APAH and IPAH were different in several key domains but could not come to agreement about differences in others:



course

















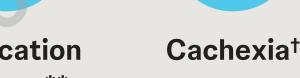
presentation



burden







options\*\*

# available. †Cachexia refers to weight loss and muscle wasting.

Physicians reached a consensus in agreement that:

Identifying patients with Meth-APAH



Screening and follow-up assessments may be affected by methamphetamine use, but should be conducted whenever possible, regardless of methamphetamine use, due to higher likelihood of poor follow-up of these patients.

erations are factors that impact treatment choice. \*\*Medication options are the PAH medications



All patients presenting with PAH should be screened for Meth-APAH regardless of the regional prevalence of methamphetamine use.

"There are a number of patients who, because they don't meet the traditional 'biased' definition of what a [methamphetamine] user looks like, are not being screened and therefore those patients are not being identified."

US Physician

## Barriers to identifying patients with Meth-APAH

- ✓ Access to transportation
- √ Comorbidities
- ✓ Patient engagement with care
- √ Socioeconomic status
- ✓ Lack of stable housing
- √ (Lack of) familial and caregiver support
- ✓ Clinician familiarity with Meth-APAH

# **Meth-APAH** A consensus in agreement was reached that:

Treatment implications and barriers for patients with



Panelists would treat a patient with Meth-APAH who is actively using methamphetamine, adjusting drug choices and route of administration as needed.



There are no Meth-APAH-specific barriers to double combination therapies (e.g., endothelin receptor antagonists and phosphodiesterase 5 inhibitors).

"[Am I] going to go for a combination therapy [only] if they are abstinent? My answer would be no, I am still going to treat [active users of methamphetamine] with combination therapy." US Physician

#### Disease-, treatment-, and patient-related factors that affect treatment choice in Meth-APAH:

#### Disease-related

- ✓ Comorbidities
- ✓ Presence of right-side heart failure
- ✓ REVEAL risk score
- ✓ Risk assessment/stratification
- ✓ Symptom severity at diagnosis
- ✓ Vasoreactivity response ✓ Congenital heart disease
- ✓ Human immunodeficiency virus

✓ Route of administration

✓ Side effect profile

# **Treatment-related**

- ✓ Clinical trial results
- ✓ Frequency of dosing
- ✓ Treatment approach (i.e., monotherapy/ combination therapy)
- ✓ Geographical location (i.e., geographical access to

## Patient-related

- ✓ Treatment compliance
- ✓ Methamphetamine use status
- ✓ Patient compliance with healthcare team instructions
- with the healthcare team
- ✓ Social/caregiver support
- ✓ Ability to communicate/interact
- ✓ Participation in a substance abuse program

✓ Treatment adherence history

- ✓ Stable housing/employment ✓ Mental health/psychiatric conditions

**REVEAL**, Registry to Evaluate Early and Long-term PAH Disease Management.

## Meth-APAH in clinical trials

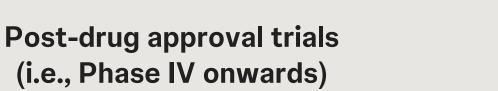
The panel agreed that patients with Meth-APAH should be included in:



**Meth-APAH** 

only trials







Subgroup analyses

Pulmonary Hypertension

Acknowledgments

funded by Johnson & Johnson.

Disclosures



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## Follow the link:

https://www.jnjmedicalconnect.com/media/attestation/congresses/ pulmonary-hypertension/2025/apapp/expert-consensus-on-thedefinition-of-methamphetamine-associated-pulmonary-arterialhypertension-met.pdf

Previously presented at the CHEST 2024 Annual Meeting; Boston, MA, USA; October 6–9, 2024 Presented at the 2nd Annual APAPP National Conference;

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