Severe Neurologic Complications After General Anesthesia in Patients of Maternal Venezuelan Ancestry

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Disclosure

I am remunerated for providing anesthesia services

There is no external support.

No conflicts to declare

Important context

Objectives

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Important context

If you have any questions I likely will not be able to assist. Please see guidelines referenced below for updates. (Slide 16)

The learning objectives for this session are:

1. Discuss current trends, issues and challenges in healthcare

2. Describe current treatments for a variety of health issues patients are experiencing in our community

3. Identify ways to improve both inpatient and outpatient care

4. Encourage and support each other in the pursuit of professional development and personal wellness and self-care opportunities.

What’s being reported

Early international case communications (emerging evidence)

- Previously healthy pediatric and adult patients of Venezuelan ancestry
- Unexpected catastrophic neurologic outcomes after routine anesthetic exposure
- Reported findings: severe neurologic injury with basal ganglia infarcts and death
- Additional cases reportedly identified in Europe and the United States

Important context

Evidence is incomplete (many cases shared via personal communication). Guidance reflects expert opinion while data evolves.

Pattern emerging across reports

What is common vs what remains unknown

- Maternal Venezuelan lineage appears to be a key risk flag (mitochondrial inheritance)
- Most reported cases involved sevoflurane exposure (dose/duration often unknown)
- Some reported patients tolerated propofol anesthetics without incident
- Limited information on co-administered agents and depth-of-anesthesia monitoring

What we don’t know yet

Incidence, absolute/relative risk, and the optimal anesthetic strategy for this genotype.

What we can do now

Screen thoughtfully, plan conservatively, monitor closely, and report suspected events.

Genetic association: mitochondrial ND4

Mutation reported: mtND4 m.11232T>C

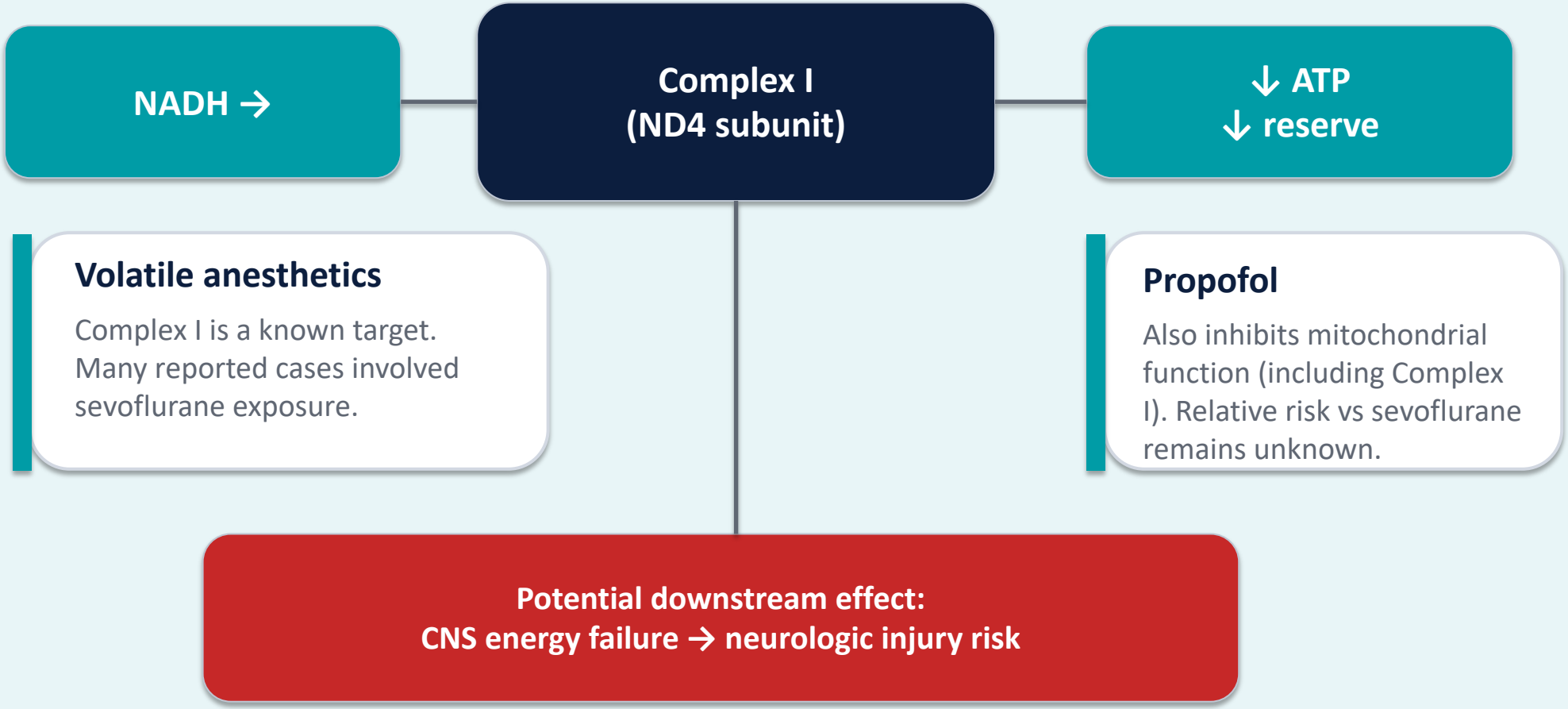
- Mitochondrial DNA is maternally inherited → maternal ancestry drives screening logic
- ND4 encodes a subunit of Complex I (electron transport chain)
- In this population, phenotype may appear silent until anesthetic exposure
- No point-of-care screening test; sequencing is available

Lab reporting nuance

Ask laboratories to explicitly report mtND4 m.11232T>C (historically interpreted as a normal variant).

Mechanistic hypothesis

Complex I inhibition → reduced ATP → neuronal vulnerability (hypothesis)



Screening: practical pre-op questions

Goal: identify possible maternal Venezuelan lineage

- Ask about maternal Venezuelan ancestry (mother / maternal grandmother / maternal lineage)
- Explain briefly why: mitochondrial DNA is inherited from the mother
- A negative family history does not exclude risk
- Use culturally sensitive language and offer context for the question

Suggested script

"We ask a brief ancestry question because a rare inherited mitochondrial variant has been linked to anesthesia complications. It relates to maternal lineage."

If positive

Escalate to anesthesiologist review; consider genetics consult if elective.

Genetic testing: what to request

Sequencing can confirm presence/absence of mtND4 m.11232T>C

- Mitochondrial DNA sequencing of the patient and/or maternal relatives
- Notify the lab to explicitly report mtND4 m.11232T>C
- Obtain informed consent
- Coordinate with local (provincial) genetics experts for interpretation and counseling

Key limitation

No point-of-care test currently available.

Elective cases

Consider deferring volatile exposure pending results when feasible.

Interim anesthetic planning (at-risk patients)

Precautionary recommendations while evidence evolves

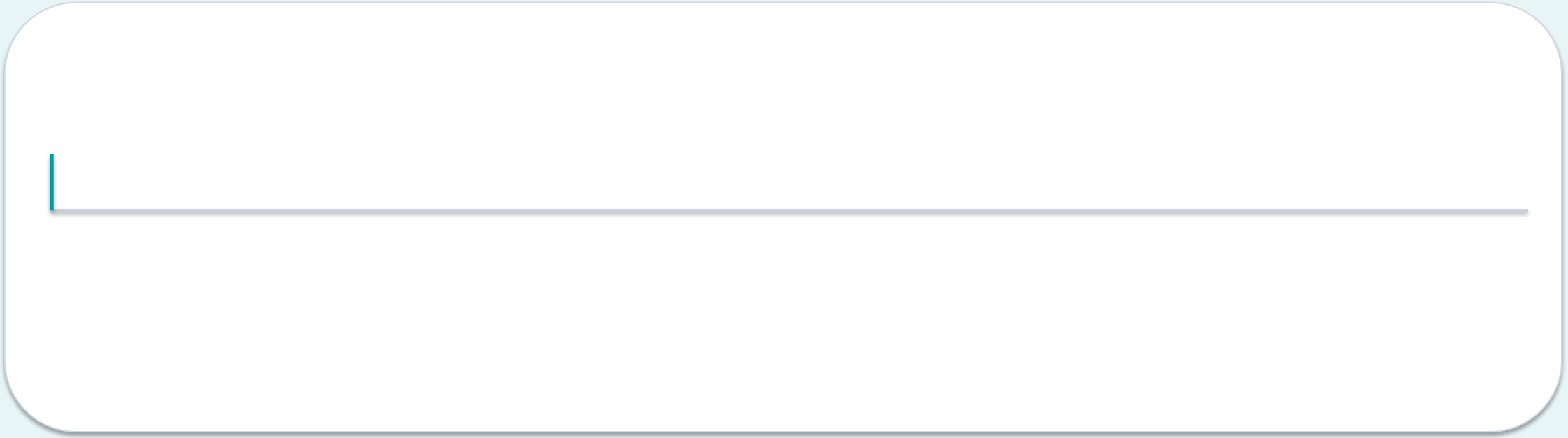
- Let procedure urgency guide proceed vs defer decisions
- Consider avoiding volatile anesthetics (signal strongest with sevoflurane reports)
- Consider regional anesthesia when appropriate
- If GA needed: consider TIVA-based approach; prolonged propofol infusion safety remains unknown
- Midazolam, dexmedetomidine, ketamine, and short/ultra-short acting opioids have not been implicated

Documentation

Record rationale and shared decision-making. This is interim guidance, not a permanent standard.

Depth-of-anesthesia monitoring

Processed EEG to avoid burst suppression (consideration)



Some Complex I mutations show rapid EEG suppression with volatile exposure (uncertain for ND4 cases).

Consider processed EEG to avoid overly deep anesthesia and burst suppression in at-risk patients.

Use clinical judgement and document rationale; evidence is evolving.

Postoperative monitoring

Aim: confirm return to baseline and detect early instability

- Assess for return to baseline mental status / neurologic function
- Consider extended observation when patient is deemed at risk
- Monitor acid-base status if complications suspected
- Escalate early for neurology/critical care support if concerning changes occur

Ambulatory setting

Reassess suitability for same-day discharge when screening is positive.

Reporting suspected cases

Build a protected dataset to refine future guidance

- Report locally per institutional patient safety policy
- Confidential reporting supports centralized analysis and updated recommendations

Why it matters

Rare signal + high severity → centralized reporting is essential to estimate risk and identify modifiable factors.

System-level implications (board / governance)

What leaders may need to support

- Add maternal ancestry screening prompt to pre-anesthesia assessment templates
- Define escalation pathway (anesthesia review → genetics referral for elective cases)
- Standardize documentation language and consent discussion support
- Review ambulatory eligibility/discharge policies for positives

Risk framing

Low-frequency, high-severity signal → precautionary controls are reasonable while data matures.

Key takeaways

1) Screen

Ask about maternal Venezuelan lineage; family history may be negative.

2) Plan conservatively

Consider avoiding volatile anesthetics; consider regional or TIVA with caution. Use judgement and document.

3) Monitor & report

Use depth monitoring and post-op observation as indicated; report suspected cases to improve evidence.

Reference

Primary source

American Society of Anesthesiologists (ASA) & Society for Pediatric Anesthesia (SPA).

Joint Communication: Update regarding severe neurological complications and death after general anesthesia in adult and pediatric patients of Venezuelan ancestry.

January 27, 2026.

Contact

Questions ?

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Important context