

1. Title: **PENS Position Statement on Stimulation Testing**

2. Authors

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3. Executive Summary

The Pediatric Endocrinology Nursing Society (PENS) is committed to the advancement of the art and science of pediatric endocrinology nursing.

Stimulation (provocative) testing is an important part of the endocrine clinical evaluation of children and adolescents to assess the function of the hypothalamic pituitary adrenal and gonadal axes and determine appropriate treatment. PENS recognizes that nurses have a critical role as advocates for safe and reliable stimulation testing to produce valid clinical results to guide the treatment of endocrine disorders in children.

This position statement outlines recommendations for healthcare facilities to provide safe, high quality, culturally sensitive, family-centered care that promotes the well-being and development of the child and supports exceptional pediatric nursing care for endocrine stimulation testing.

4. Background

- Patient safety is defined by The National Academy of Medicine as the prevention of harm to patients, that is indistinguishable from the delivery of quality health care. To promote patient safety, emphasis is placed on the system of care delivery to prevent errors and on learning from the errors that do occur, to foster a culture of safety that involves health care professionals, organizations, and

patients. The AHRQ Patient Safety Network website expands upon the definition of prevention of harm as “freedom from accidental or preventable injuries produced by medical care.”

- Children are at greater risk of medication errors due to developmental (i.e., physical, mental age, and communication skills) and physiological (e.g., weight-based dosing) differences from adults. Pediatric medical errors affect as many as one-third of all hospitalized children and an unknown number of children in ambulatory settings. Studies of errors in the pediatric ambulatory setting attributed the largest group of errors to medical treatment; other errors included patient identification, preventative care (including immunizations), diagnostic testing, and patient communication. (Mueller, B. U., Neuspiel D. R., Fisher E. R. S. 2019).
- Pediatric ambulatory health centers utilize various levels of healthcare providers and staff- to patient ratios. Adequate registered nurse staffing is critical to deliver safe, cost-effective, and quality patient care. Dynamic endocrine testing (aka ‘stimulation or provocative testing’) may be technically difficult due to the preparation and administration of the provocative agent(s); preparing and monitoring of the child; monitoring for adverse effects; and the proper collection, labeling, and handling of specimens to obtain accurate test results.

5. Position

As nurses with expert knowledge of the pathophysiology of the endocrine system and the physical and psychosocial factors affecting the health and development of children and youth, PENS:

- 1) Supports the development of valid and reliable staffing plans that include a professional registered nurse experienced with stimulation testing in children for healthcare facilities that perform endocrine stimulation testing.
- 2) Endorses that individuals performing stimulation testing must be licensed by their state as registered nurses or licensed professional nurses. Medical assistants may support professional staff but should not perform testing independently. State law may restrict certified medical assistants to assist with stimulation testing only under the supervision of a pediatric endocrinologist or advanced practice registered nurse (pediatric or family nurse practitioner (NP)).
- 3) Supports programs to educate healthcare personnel who perform stimulation testing. Components of the competency-based education include:
 - Principles of growth and development in children
 - Age-appropriate interventions to maximize comfort and minimize apprehension during stimulation testing procedures
 - Factors that affect the reliability of an endocrine stimulation test, such as proper height and weight measurements and training in phlebotomy and intravenous access

- Physiological concepts related to the testing, including the drug properties of the stimulating agents to be administered, the lab tests ordered, and the variable outcomes testing may achieve
- Safety parameters of each dynamic test, how to monitor, and recognition of when a change in course is needed
- Safe and appropriate preparation and administration of stimulation agents
- Potential adverse events that may occur during and after dynamic testing and appropriate interventions (within their licensure) when in occurrence
- Proper collection and handling of timed specimens
- Expected progress of recovery after completion of testing and physiological markers to determine the safety of discharge of patients from the facility

4) Supports the development of policies and protocols by healthcare facilities that offer endocrine stimulation testing. Components of the policies and protocols include:

- Development of evidence-based protocols for all stimulation tests performed
- Evaluation of the stimulating agents used and their potential adverse events
- Appropriate registered nurse staffing for stimulation tests (i.e., 1:1 staff to patient for Insulin Tolerance Test), and the supervision of a pediatric endocrinologist or advanced practice registered nurse (pediatric or family NP) during testing

- Competency-based training of medical personnel for stimulation testing procedures, proper handling of specimens, medication administration, side effects, and proper treatment of side effects
- Availability of age-appropriate pediatric medical emergency equipment
- Pediatric age-specific clinical ranges for all laboratory studies
- Review of the stimulation testing policies and procedures consistent with the institution's multidisciplinary safety advisory team, including review of protocols with a frequency consistent with the facility's sanctions

5) Supports programs to train nurses to ensure competency with the nursing process and assessment of the child prior to, during, and post- testing. Important components of the training for nursing staff include:

- Chart review should be performed regarding allergies, current medications, and significant medical history (i.e., cardiac, or neurologic conditions). Consult with pediatric endocrinologist or advanced practice registered nurse (pediatric or family NP) regarding which medications should be held the day prior or the day of stimulation testing or if alterations in choice of provocative agents is warranted.
- Obtain baseline parameters of height, weight, and vital signs.
- Confirm allergies, medications taken within the last 24 hours, and fasting status as applicable.

- Review procedures, relevant physiological concepts, and medications, including their related side effects and safety protocols with patients and families.
 - Establish intravenous access and monitor patency.
 - Bedside glucose testing must be available for patients who are at risk for hypoglycemia or induced hypoglycemia from stimulating agents used during the test. Glucose testing should be documented alongside any supporting signs and symptoms.
 - Best clinical practice recommendations: review provocative agent(s) dose calculations and route of medication administration with a second healthcare clinician prior to administration. Insulin must be double-checked with another licensed healthcare clinician. All medications should be charted according to the testing facility policy.
 - Continually monitor and document vital signs per testing protocols.
 - Monitor and document psychosocial status as relevant to the interpretation of results.
 - Before intravenous access removal, confirm and document the resolution of important physiological markers that may have been affected by stimulating agents administered during the test (i.e., blood glucose levels and vital signs) and document that the patient meets safety parameters for discharge.
- 6) Support the provision of both verbal and written instructions to patients and their caregivers regarding pre-testing preparation, expectations during the stimulation

testing procedure, post-testing recovery, timeline of result reporting, possible testing outcomes, and next steps if treatment is warranted.

6. Acknowledgements

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7. References

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