Non-Obstructive Azoospermia (NOA) Survey

* Indicates required question

GLOBAL ANDROLOGY FORUM

Introduction
Dear Colleague,

The management of Non-Obstructive Azoospermia (NOA) is one of the most challenging, and exciting, area of andrology. It is also highly controversial with many therapeutic options and approaches but few guidelines or consensus. This global survey aims to document the management protocols for NOA across the world and thus provide the clinicians an opportunity to compare their protocols with global practices.

We invite urologists, andrologists and other reproductive specialists involved in the clinical management of men with NOA to participate in this study. It should not take more than 15-20 minutes and your participation will add your opinion to this very valuable perspective on how NOA is managed globally.

Please note that your responses cannot be saved in the middle, so you need to complete the survey at one go. Thank you for your time.

Warm regards,
Global Andrology Forum
Website: https://www.globalandrologyforum.com/

Demographics

1. Q1: Name *

2. Q2: E-mail address *

3. Q3: In which country do you currently practice? *

Mark only one oval.

- Afghanistan
- Albania
- Algeria
- Andorra
- Angola
- Antigua and Barbuda
- Argentina
- Armenia
- Australia
- Austria
- Azerbaijan
- The Bahamas
- Bahrain
- Bangladesh
- Barbados
- Belarus
- Belgium
- Belize
- Benin
- Bhutan
- Bolivia
- Bosnia and Herzegovina
- Botswana
- Brazil
- Brunei
- Bulgaria
- Burkina Faso
- Burundi

- Cabo Verde
- Cambodia
- Cameroon
- Canada
- Central African Republic
- Chad
- Chile
- China
- Colombia
- Comoros
- Congo, Democratic Republic of the
- Congo, Republic of the
- Costa Rica
- Côte d’Ivoire
- Croatia
- Cuba
- Cyprus
- Czech Republic
- Denmark
- Djibouti
- Dominica
- Dominican Republic
- East Timor (Timor-Leste)
- Ecuador
- Egypt
- El Salvador
- Equatorial Guinea
- Eritrea
- Estonia
- Eswatini

- Ethiopia
- Fiji
- Finland
- France
- Gabon
- The Gambia
- Georgia
- Germany
- Ghana
- Greece
- Grenada
- Guatemala
- Guinea
- Guinea-Bissau
- Guyana
- Haiti
- Honduras
- Hungary
- Iceland
- India
- Indonesia
- Iran
- Iraq
- Ireland
- Israel
- Italy
- Jamaica
- Japan
- Jordan
- Kazakhstan

- Kenya
- Kiribati
- Korea, North
- Korea, South
- Kosovo
- Kuwait
- Kyrgyzstan
- Laos
- Latvia
- Lebanon
- Lesotho
- Liberia
- Libya
- Liechtenstein
- Lithuania
- Luxembourg
- Madagascar
- Malawi
- Malaysia
- Maldives
- Mali
- Malta
- Marshall Islands
- Mauritania
- Mauritius
- Mexico
- Micronesia, Federated States of
- Moldova
- Monaco
- Mongolia

- Montenegro
- Morocco
- Mozambique
- Myanmar (Burma)
- Namibia
- Nauru
- Nepal
- Netherlands
- New Zealand
- Nicaragua
- Niger
- Nigeria
- North Macedonia
- Norway
- Oman
- Pakistan
- Palau
- Panama
- Papua New Guinea
- Paraguay
- Peru
- Philippines
- Poland
- Portugal
- Qatar
- Romania
- Russia
- Rwanda
- Saint Kitts and Nevis
- Saint Lucia

- Saint Vincent and the Grenadines
- Samoa
- San Marino
- Sao Tome and Principe
- Saudi Arabia
- Senegal
- Serbia
- Seychelles
- Sierra Leone
- Singapore
- Slovakia
- Slovenia
- Solomon Islands
- Somalia
- South Africa
- Spain
- Sri Lanka
- Sudan
- Sudan, South
- Suriname
- Sweden
- Switzerland
- Syria
- Taiwan
- Tajikistan
- Tanzania
- Thailand
- Togo
- Tonga
- Trinidad and Tobago

- Tunisia
- Turkey
- Turkmenistan
- Tuvalu
- Uganda
- Ukraine
- United Arab Emirates
- United Kingdom
- United States
- Uruguay
- Uzbekistan
- Vanuatu
- Vatican City
- Venezuela
- Vietnam
- Yemen
- Zambia
- Zimbabwe

4. Q4: What is the nature of your employment? *

Check all that apply.

- [ ] a. Physician, attending
- [ ] b. Physician, fellow
- [ ] c. Physician, resident
- [ ] d. Advanced practice provider (Physician Assistant, Nurse Practitioner)
- [ ] e. Other (specify)

5. Q5: What is your area of specialization (as it relates to male infertility)? *

Check all that apply.

- [ ] a. Fellowship-trained reproductive urology
- [ ] b. General urology
- [ ] c. Reproductive Endocrinology/ART specialist
- [ ] d. Endocrinology
- [ ] e. Other (specify)
- [ ] Other: ______________________

6. Q6: What is your practice setting? *

Check all that apply.

- [ ] a. Academic
- [ ] b. Public
- [ ] c. Private
- [ ] d. Multiple
- [ ] e. Other (specify)
- [ ] Other: ______________________

7. Q7: How many years have you been practicing (related to male infertility)? *

Mark only one oval.

- ( ) a. Less than 2 years
- ( ) b. 2-5 years
- ( ) c. 6-10 years
- ( ) d. 11-15 years
- ( ) e. More than 15 years

8. Q8: On average, how many new infertile couples do you evaluate per week? *

Mark only one oval.

- a. Less than 10
- b. 11-20
- c. 21-30
- d. 31-40
- e. 41-50
- f. More than 50

Diagnosis/Evaluation of NOA

9. Q9: In your practice, what is the estimated proportion of NOA among men who present for fertility concerns?

Mark only one oval.

- a. Less than 10% of cases
- b. 10-25% of cases
- c. 26-50% of cases
- d. More than 50% of cases
- e. Not applicable to my practice

10. Q10: In your practice, what is the proportion of clinically significant varicocele among men with NOA?

Mark only one oval.

- a. Less than 10% of cases
- b. 10-25% of cases
- c. 26-50% of cases
- d. More than 50% of cases
- e. Not applicable to my practice

11. Q11: How many semen samples do you usually order before confirming the diagnosis of NOA?

Mark only one oval.

- a. 1
- b. 2
- c. 3 or more
- d. Not applicable to my practice

12. Q12: How long do you think is the optimal time interval to repeat sperm analysis in diagnosing NOA?

Mark only one oval.

- a. Less than 14 days
- b. 14-29 days
- c. 1 month
- d. 2 months
- e. 3 months
- f. More than 3 months
- g. variable depending on the case

13. Q13: What hormonal evaluation do you routinely perform in patients with NOA? (you can select multiple options)

Check all that apply.

- [ ] a. FSH
- [ ] b. LH
- [ ] c. Prolactin
- [ ] d. Total testosterone
- [ ] e. Free testosterone
- [ ] f. SHBG
- [ ] g. Estradiol
- [ ] h. Inhibin B
- [ ] i. I do not routinely perform a hormonal evaluation
- [ ] j. other (specify)
- [ ] Other: ____________________

14. Q14: Do you perform genetic testing in patients with NOA?

Mark only one oval.

- ( ) a. Always
- ( ) b. Majority of the cases
- ( ) c. In selected cases
- ( ) d. Never
- ( ) e. Not applicable to my practice

15. Q15: What are the genetic tests you routinely perform in patients with NOA? (you can select multiple options)

Check all that apply.

- [ ] a. Karyotype
- [ ] b. Y chromosome microdeletion
- [ ] c. CFTR gene
- [ ] d. Kal1 gene
- [ ] e. Not applicable to my practice
- [ ] f. Other (specify)
- [ ] Other: ____________________

16. Q16: In the presence of which of the following genetic disorders, would you perform/recommend a surgical sperm retrieval (cTESE/mTESE) in patients with NOA? (you can select multiple options)

Check all that apply.

- [ ] a. AZFa deletion
- [ ] b. AZFb deletion
- [ ] c. AZFc deletion
- [ ] d. 47,XXY
- [ ] e. None, I usually recommend donor sperm or adoption in these cases
- [ ] f. Not applicable to my practice

17. Q17: Do you perform diagnostic testicular biopsy to differentiate between OA (obstructive azoospermia) and NOA?

Mark only one oval.

- a. Routinely-unilateral
- b. Routinely-bilateral
- c. In select patients
- d. No
- e. Not applicable to my practice

18. Q18: In your clinical practice, which of the following do you find MOST HELPFUL in the differentiation between OA and NOA? (you can select up to 3 options)

Check all that apply.

- a. Clinical examination (e.g. testicular volume, epididymal turgidity, … etc)
- b. Basic and extended tests of semen (e.g. semen volume, pH, levels of fructose and α-glucosidase)
- c. Serum levels of reproductive hormones
- d. Scrotal US
- e. Transrectal US
- f. Combined testicular long axis length and FSH level
- g. Not applicable to my practice
- h. Others
- Other: ____________________

19. Q19: Do you send a testicular biopsy for histopathology at the time of surgical sperm retrieval?

Mark only one oval.

- a. Routinely-unilateral
- b. Routinely-bilateral
- c. Select patients
- d. No
- e. Not applicable to my practice

20. Q20: In your practice which of the following is/are predictive of a higher chance of sperm retrieval by cTESE/mTESE? (you can select multiple options)

Check all that apply.

- [ ] a. Normal FSH
- [ ] b. Normal Testosterone
- [ ] c. Normal testicular volume
- [ ] d. Histopathology showing late maturation arrest
- [ ] e. Histopathology showing hypospermatogenesis
- [ ] f. Histopathology showing SCO
- [ ] g. Histology showing atrophy
- [ ] h. Past history of sperm in the ejaculate
- [ ] i. History of acquired testicular damage e.g. mumps orchitis, orchiopexy, etc
- [ ] j. None of these
- [ ] k. Not applicable to my practice

21. Q21: In which situation do you refer an azoospermic patient to a genetic counselor: (you can select multiple options)

Check all that apply.

- [ ] a. NOA with Y microdeletion
- [ ] b. NOA in Klinefelter patient
- [ ] c. OA with CFTR mutation
- [ ] d. I do the genetic counseling myself; I do not refer to counselor
- [ ] e. Not applicable to my practice

Medical Therapy

22. Q22: Do you use empirical antioxidant therapy before sperm retrieval procedure in a NOA patient?

Mark only one oval.

- ( ) a. Yes, in most cases
- ( ) b. Yes, in selected cases
- ( ) c. I have never recommend antioxidants in NOA
- ( ) d. Not applicable to my practice

23. Q23: Which NOA patients do you offer hormonal therapy prior to sperm retrieval? (you can select multiple options)

Check all that apply.

- [ ] a. Hypogonadotropic hypogonadism
- [ ] b. Hypergonadotropic hypogonadism
- [ ] c. Normogonadotropic hypogonadism
- [ ] d. All NOA patients
- [ ] e. After first failure of sperm retrieval, prior to repeat attempt
- [ ] f. I do not believe that hormone therapy helps in eugonadotropic or hypergonadotropic NOA
- [ ] g. Not applicable to my practice

24. Q24: How long do you recommend hormonal therapy before sperm retrieval in a NOA patient (excluding hypogonadotropic hypogonadism)?

Mark only one oval.

- a. I do not routinely recommend hormone therapy
- b. 1-2 months
- c. 3 months
- d. 6 months
- e. 1 year
- f. Depends on hormonal response
- g. Not applicable

25. Q25: If yes, how do you evaluate the effect of hormonal therapy before sperm retrieval? (you may select multiple options)

Check all that apply.

- [ ] a. T/E2 level
- [ ] b. T level
- [ ] c. FSH level
- [ ] d. LH level
- [ ] e. Not applicable
- [ ] f. Other (specify)
- [ ] Other: ____________________

26. Q26: Which hormonal therapy do you prescribe before sperm retrieval in a HYPERGONADOTROPIC NOA patient ? (you may select multiple options)

Check all that apply.

- [ ] a. I do not prescribe hormone therapy for men with hypergonadotropic NOA
- [ ] b. Clomiphene citrate 25 mg daily
- [ ] c. Clomiphene citrate 50 mg daily
- [ ] d. Aromatase inhibitor 1 mg daily or on alternate days
- [ ] e. Highly purified HMG (FSH) 75 IU two to three times weekly
- [ ] f. Recombinant FSH 75 IU two to three times weekly
- [ ] g. FSH / HMG 150 IU three times a week
- [ ] h. Choriogonadotropin Alfa (HCG) 1500 to 5000 IU two to three times weekly
- [ ] i. Recombinant Choriogonadotropin Alfa 250 mcg once-a-week
- [ ] j. Combination of HCG and HMG/FSH
- [ ] k. HCG + Clomiphene citrate / aromatase inhibitor
- [ ] l. Not applicable to my practice
- [ ] m. Others (specify)
- [ ] Other: ____________________

27. Q27: Which hormonal therapy do you prescribe before sperm retrieval in a EUGONADOTROPIC NOA patient ? (you may select multiple options)

Check all that apply.

- [ ] a. I do not prescribe hormone therapy for men with normogonadotropic NOA
- [ ] b. Clomiphene citrate 25 mg daily
- [ ] c. Clomiphene citrate 50 mg daily
- [ ] d. Aromatase inhibitors 1 mg daily
- [ ] e. Highly purified HMG (FSH) 75 IU two to three times weekly
- [ ] f. Recombinant FSH 75 IU two to three times weekly
- [ ] g. FSH / HMG 150 IU three times a week
- [ ] h. Choriogonadotropin Alfa (HCG) 1500 to 5000 IU two to three times weekly
- [ ] i. Recombinant Choriogonadotropin Alfa 250 mcg once-a-week
- [ ] j. HCG + Clomiphene citrate / aromatase inhibitor
- [ ] k. HCG + HMG/FSH
- [ ] l. Not applicable to my practice
- [ ] m. Others (specify)
- [ ] Other: ______________________

28. Q28: In cases of NOA due to exogenous testosterone, what do you usually advise to recover spermatogenesis?

Mark only one oval.

- ( ) a. Stop exogenous testosterone and allow natural recovery
- ( ) b. Stop testosterone and start clomiphene
- ( ) c. Stop testosterone and start HCG
- ( ) d. Stop testosterone and start both HCG and clomiphene
- ( ) e. Stop testosterone and start HCG and HMG/FSH
- ( ) f. Any of the above depending on duration of testosterone use, age of patient, gonadotropin levels , etc
- ( ) g. Not applicable to my practice

29. Q29: Do you prescribe exogenous testosterone therapy when a man with NOA has low testosterone level and is yet to undergo sperm retrieval?

Mark only one oval.

- a. Usually
- b. Sometimes
- c. No, I give HCG/LH or SERMs or Aromatase inhibitors
- d. Not applicable to my practice

Surgical Therapy

30. Q30: How frequently do you perform m-TESE for NOA cases in your practice?

Mark only one oval.

- a. Less than 10% of NOA cases
- b. 10-25% of NOA cases
- c. 25-50% of NOA cases
- d. 50-75% of NOA cases
- e. 75-100% of NOA cases
- f. Not applicable to my practice

31. Q31: In your experience what is the overall surgical sperm retrieval rate in men with NOA?

Mark only one oval.

- a. Less than 10%
- b. 11-25%
- c. 26-50%
- d. More than 50%

32. Q32: What is the general acceptability of m-TESE in your practice?

Mark only one oval.

- a. Most couples opt for m-TESE as they prefer their own sperm
- b. Most couples prefer donor sperm rather than m-TESE
- c. Most couples opt for both options in the same cycle (mTESE with donor standby)
- d. Varies depending on religion and financial status of couple
- e. Not applicable to my practice

33. Q33: When you perform surgical sperm retrieval, your laboratory team works:

Mark only one oval.

- a. In the operating room
- b. In the same facility in a nearby room
- c. In another facility requiring transport of the specimen for some distance
- d. Not applicable to my practice

34. Q34: How much time will your embryologist team spend looking for sperm before declaring absence of sperm in retrieved samples at the time of mTESE?

Mark only one oval.

- a. Less than 30 minutes
- b. 30-60 minutes
- c. 61-120 minutes
- d. More than 120 minutes
- e. Not applicable to my practice

35. Q35: During mTESE for ICSI, does your IVF center prefer fresh or cryopreserved sperm?

Mark only one oval.

- a. Fresh sperm more than Cryopreserved sperm
- b. Cryopreserved more than Fresh sperm
- c. Cryopreserved sperm only
- d. Fresh sperm only
- e. Not applicable to my practice

36. Q36: Do you recommend microsurgical varicocelectomy if there is a large varicocele associated with NOA?

Mark only one oval.

- a. Yes, in most cases
- b. Occasionally
- c. Rarely
- d. Never
- e. Not applicable to my practice.

37. Q37: When do you recommend surgery for a varicocele associated with NOA? (you may select multiple options)

Check all that apply.

- [ ] a. Large varicocele
- [ ] b. Relatively smaller ipsilateral testis
- [ ] c. Relatively normal FSH (<10 IU/L)
- [ ] d. High FSH level (>10 IU/L)
- [ ] e. I perform a diagnostic testicular biopsy and then recommend varicocele repair if histology is favorable.
- [ ] f. Younger female partner (usually <35y)
- [ ] g. I do not recommend varicocele repair in NOA
- [ ] h. Not applicable to my practice

38. Q38: If a patient has a genetic abnormality (AZFc deletion or 47XXY) as well as clinical varicocele and NOA, what treatment option would you recommend?

Mark only one oval.

- ( ) a. Varicocele repair first followed by sperm retrieval
- ( ) b. Sperm retrieval first followed by varicocele repair if unsuccessful
- ( ) c. Sperm retrieval only, would not repair varicocele in this situation
- ( ) d. Not applicable to my practice

39. Q39: Would you recommend surgery for sub-clinical varicocele in NOA patients without other pathology present?

Mark only one oval.

- ( ) a. Yes
- ( ) b. No

40. Q40: In your practice, what is the proportion of sperm recovery in the ejaculate of NOA men following varicocele repair?

Mark only one oval.

- a. Never, or almost never recover
- b. Less than 10%
- c. 10%-25%
- d. 26%-50%
- e. More than 50%
- f. Not applicable to my practice

41. Q41: In your experience, what is the sperm retrieval rate in patients with Klinefelter syndrome?

Mark only one oval.

- a. Less than 10%
- b. 10-25%
- c. 26-50%
- d. More than 50%

42. Q42: Do you use imaging targeted testicular biopsies in NOA?

Mark only one oval.

- a. I perform needle biopsies using color Doppler enhanced ultrasound in order to identify the most vascularized areas of testicular parenchyma
- b. I perform cTESE by doing multiple random biopsies without any imaging
- c. Not applicable to my practice

43. Q43: Do you use any of the following innovations to increase sperm retrieval rate during mTESE?

Check all that apply.

- [ ] a. Multiphoton microscopy
- [ ] b. Optical coherence tomography
- [ ] c. Raman spectroscopy
- [ ] d. None
- [ ] e. Others (specify)
- [ ] Other: ____________________

44. Q44: Do you perform diagnostic fine needle aspiration (FNA) mapping prior to doing a sperm retrieval procedure?

Mark only one oval.

- ◯ a. Yes routinely
- ◯ b. Yes in selected cases
- ◯ c. No, I do not believe it helps
- ◯ d. No, it does not help and compromises subsequent sperm retrieval
- ◯ e. Not applicable to my practice.

45. Q45: How do you plan TESA versus c-TESE versus m-TESE in men with NOA?

Mark only one oval.

- a. I routinely do TESA first followed by c-TESE or m-TESE at a second session if the TESA failed to find sperm
- b. I routinely do c-TESE first followed by m-TESE at a second session if the c-TESE failed to find sperm
- c. I routinely do c-TESE first followed by m-TESE at the same session if the c-TESE attempt fails to find sperm
- d. On a case by case basis. Sometimes I will perform cTESE first followed by mTESE in the same or at a second session if no sperm are found on cTESE, and other times I will proceed directly to mTESE
- e. I always proceed directly to m-TESE
- f. Not applicable to my practice.

46. Q46: In which clinical situations do you feel that mTESE is significantly superior to cTESE? (you may select multiple options)

Check all that apply.

- [ ] a. Small testes
- [ ] b. Very high FSH
- [ ] c. History of testicular insult or injury
- [ ] d. Klinefelter syndrome
- [ ] e. In every case of sperm retrieval in NOA
- [ ] f. None of the above

47. Q47: How long do you wait to perform mTESE after a failed cTESE in men with NOA?

Mark only one oval.

- a. 3 months
- b. 6 months
- c. 9 months
- d. 12 months
- e. No specific duration
- f. I do not do mTESE if cTESE has failed
- g. Not applicable to my practice

48. Q48: How long do you wait to repeat mTESE after a successful mTESE in men with NOA?

Mark only one oval.

- a. 3 months
- b. 6 months
- c. 9 months
- d. 12 months
- e. No specific duration
- f. Not applicable to my practice

49. Q49: How long do you wait to perform repeat mTESE after a failed mTESE?

Mark only one oval.

- a. 3 months
- b. 6 months
- c. 9 months
- d. 12 months
- e. No specific duration
- f. I do not repeat mTESE if a correctly performed first attempt has failed
- g. Not applicable to my practice

50. Q50: In a man with NOA and bilaterally symmetrical testes, if no sperm are found on one side during m-TESE you would:

Mark only one oval.

- a. Not proceed to the second side because you do not expect to find sperm
- b. Proceed to the second side with less than 5% expectation of finding sperm
- c. Proceed to the second side with a 5 -10% expectation of finding sperm
- d. Proceed to the second side with a 10-20% expectation of finding sperm
- e. Proceed to the second side with more than 20% expectation of finding sperm
- f. Not applicable to my practice

51. Q51: Based on your experience, what is the highest level of FSH hormone at which you could surgically obtain sperm in NOA

Mark only one oval.

- a. 12-19 IU/ml
- b. 20-40 IU/mL
- c. 41-60 IU/mL
- d. 61-80 IU/mL
- e. More than 80 IU/L
- f. : There is no upper limit of FSH that impacts my sperm retrieval

52. Q52: Do you recommend pre-implantation genetic testing of embryos in couples undergoing IVF/ICSI when sperm has been retrieved through microTESE in men with 47XXY?

Mark only one oval.

- a. Yes, routinely
- b. No, not usually
- c. Optionally in some cases
- d. Not applicable to my practice

Future Horizons

53. Q53: Do you utilize any of the following treatments before sperm retrieval procedure in NOA patients?

Mark only one oval.

- a. Stem cell therapy
- b. Platelet rich plasma
- c. None of these
- d. Not applicable to my practice
- e. Other (specify)
- Other: ____________________

54. Q54: Do you think there is a role for use of testicular MRI prior to sperm retrieval procedures in patients with NOA?

Mark only one oval.

- a. Yes, MRI can identify if there is spermatogenesis in the testicles
- b. No, MRI is experimental and should not be used routinely

55. Q55: Do you perform testicular tissue cryopreservation prior to gonadotoxic therapy that can lead to NOA in pre-pubertal boys?

Mark only one oval.

- a. Yes
- b. No
- c. Not applicable to my practice

56. Q56: What do you think will be the biggest advancement in the treatment of NOA over the next 10 years? (you may choose more than one answer)

Check all that apply.

- [ ] a. Gene therapy
- [ ] b. Stem cells
- [ ] c. Platelet rich plasma
- [ ] d. Advancement in imaging studies
- [ ] e. Artificial sperm
- [ ] f. 3D printing of testes or sperm
- [ ] g. Artificial intelligence
- [ ] h. Other (specify)
- [ ] Other: ____________________
