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THE RELATIONSHIP BETWEEN TS  
AND AUTISM

ROGER KURLAN, MD  
195 MOUNTAIN AVE, SPRINGFIELD, NJ  
973-850-4622

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NOTE

THE RELATIONSHIP BETWEEN ASD AND TS HAS RECEIVED LITTLE CLINICAL OR RESEARCH ATTENTION SO THE FOLLOWING INFORMATION SHOULD BE CONSIDERED PRELIMINARY. MUCH MORE RESEARCH IS NEEDED.

A KEY QUESTION: IS TS PART OF THE AUTISM SPECTRUM DISORDER?

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WORKING DEFINITIONS

TS: CHRONIC MOTOR AND VOCAL TICS

AUTISM SPECTRUM DISORDER (ASD):

- IMPAIRED SOCIAL INTERACTIONS
- IMPAIRED COMMUNICATION
- EMOTIONAL DETACHMENT

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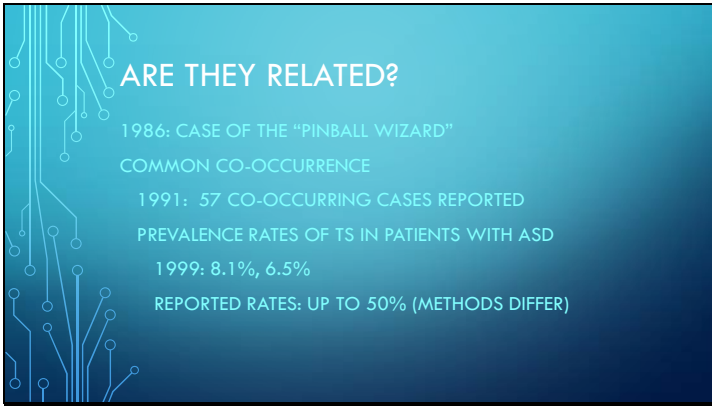
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**ARE THEY RELATED?**

1986: CASE OF THE "PINBALL WIZARD"  
COMMON CO-OCCURRENCE  
1991: 57 CO-OCCURRING CASES REPORTED  
PREVALENCE RATES OF TS IN PATIENTS WITH ASD  
1999: 8.1%, 6.5%  
REPORTED RATES: UP TO 50% (METHODS DIFFER)

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**CLINICAL OVERLAPS**

- "TS TRIAD"- TICS, OCD, ADHD
- ECHOPHENOMENA
- SELF-INJURIOUS BEHAVIOR
- MOOD, ANXIETY DISORDERS
- IMPULSE CONTROL PROBLEMS, RAGE ATTACKS
- LEARNING DISABILITIES
- ENVIRONMENTAL SENSITIVITIES (TOUCH, SOUND, LIGHT)

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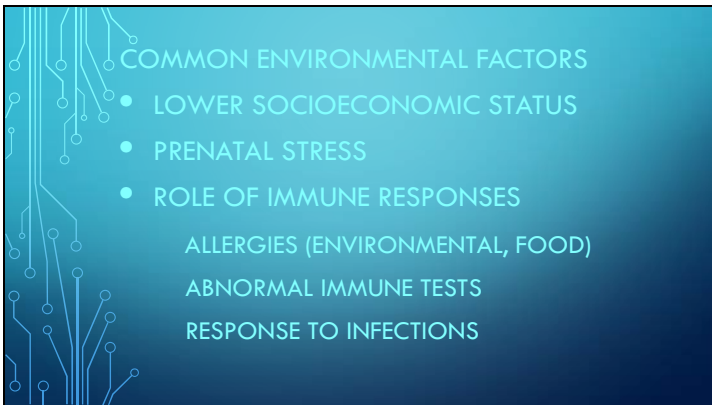
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**COMMON ENVIRONMENTAL FACTORS**

- LOWER SOCIOECONOMIC STATUS
- PRENATAL STRESS
- ROLE OF IMMUNE RESPONSES

ALLERGIES (ENVIRONMENTAL, FOOD)  
ABNORMAL IMMUNE TESTS  
RESPONSE TO INFECTIONS

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**CLINICAL DIFFERENCES?**

- AGE AT ONSET (18 MONTHS FOR ASD, 7 FOR TS)
- STEREOTYPES IN ASD
- DO QUALITIES OF TICS DIFFER?
  - WAXING AND WANING
  - CHANGE IN TYPES
  - NATURAL HISTORY- IMPROVEMENT VS REGRESSION
- MOST TS PATIENTS DO NOT HAVE SOCIAL, EMOTIONAL, COMMUNICATION PROBLEMS SEEN IN ASD

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**COMMON MECHANISMS?**

- TRYPTOPHAN OXYGENASE GENE (SEROTONIN)
- ASD DUE TO HOMOZYGOSITY OF A TS GENE
- SHARED FRONTO-STRIATAL SUBSTRATE
- TICS COMMON IN RELATIVES OF ASD PATIENTS
- RARE COPY NUMBER VARIANTS
- SHARED CANDIDATE GENES (SYNAPSE FORMATION, EXCITATORY/INHIBITORY BALANCE)

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**OUR OWN RESEARCH**

ASD + TICS HAS DIFFERENT GENETIC PATTERN THAN ASD + STEREOTYPES OR ASD ALONE

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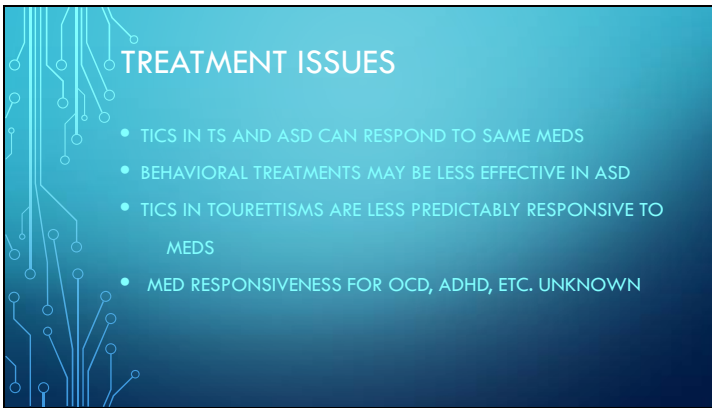
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## TREATMENT ISSUES

- TICS IN TS AND ASD CAN RESPOND TO SAME MEDS
- BEHAVIORAL TREATMENTS MAY BE LESS EFFECTIVE IN ASD
- TICS IN TOURETTISMS ARE LESS PREDICTABLY RESPONSIVE TO MEDS
- MED RESPONSIVENESS FOR OCD, ADHD, ETC. UNKNOWN

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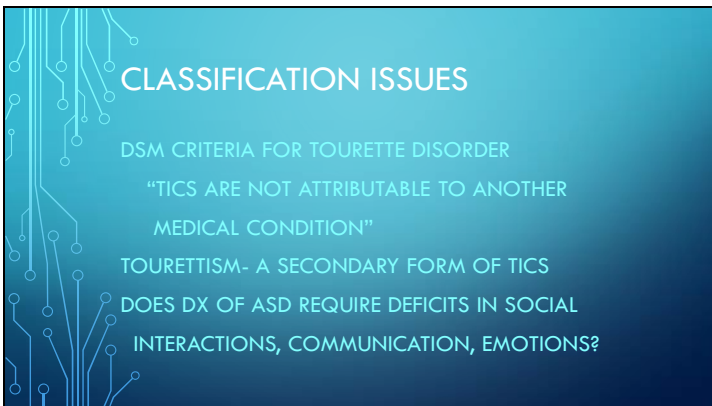
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## CLASSIFICATION ISSUES

DSM CRITERIA FOR TOURETTE DISORDER  
"TICS ARE NOT ATTRIBUTABLE TO ANOTHER  
MEDICAL CONDITION"

TOURETTISM- A SECONDARY FORM OF TICS

DOES DX OF ASD REQUIRE DEFICITS IN SOCIAL  
INTERACTIONS, COMMUNICATION, EMOTIONS?

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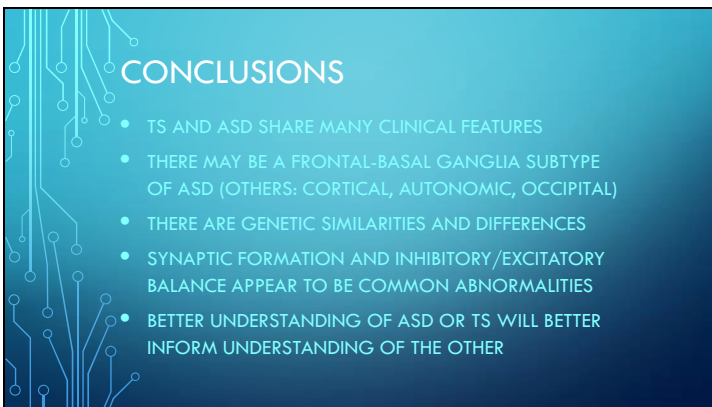
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## CONCLUSIONS

- TS AND ASD SHARE MANY CLINICAL FEATURES
- THERE MAY BE A FRONTAL-BASAL GANGLIA SUBTYPE OF ASD (OTHERS: CORTICAL, AUTONOMIC, OCCIPITAL)
- THERE ARE GENETIC SIMILARITIES AND DIFFERENCES
- SYNAPTIC FORMATION AND INHIBITORY/EXCITATORY BALANCE APPEAR TO BE COMMON ABNORMALITIES
- BETTER UNDERSTANDING OF ASD OR TS WILL BETTER INFORM UNDERSTANDING OF THE OTHER

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