

# Pediatric Scrotal Pain: Development of a Computer-Assisted Triage Protocol

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# Background

- Scrotal pain infrequent ER visit but common surgical consultation
- Differential diagnosis wide
- Majority DO NOT have testicular torsion
- ER triage based on signs, symptoms and tests

# Background

- Delays in appropriate treatment can be disastrous for testis/physician
- “Gold-standard” test (duplex Doppler ultrasound) imperfect and costly
- Triage using a MET system has been developed for acute abdominal pain





# Purpose

- Review typical ER presentation to determine common “attributes” in diagnosis
- Develop a PDA format to allow data acquisition
- Determine if a hand-based computer digital assistant can aid in triage

# Materials and methods

- Retrospective chart review
- 103 boys seen in CHEO ER with diagnosis “acute scrotal pain”
- I.C.: 1-17 years, presenting complaint “scrotal pain”, duration up to 10 days
- E.C.: pain 2nd to trauma, previous treatment, or direct Urology referral

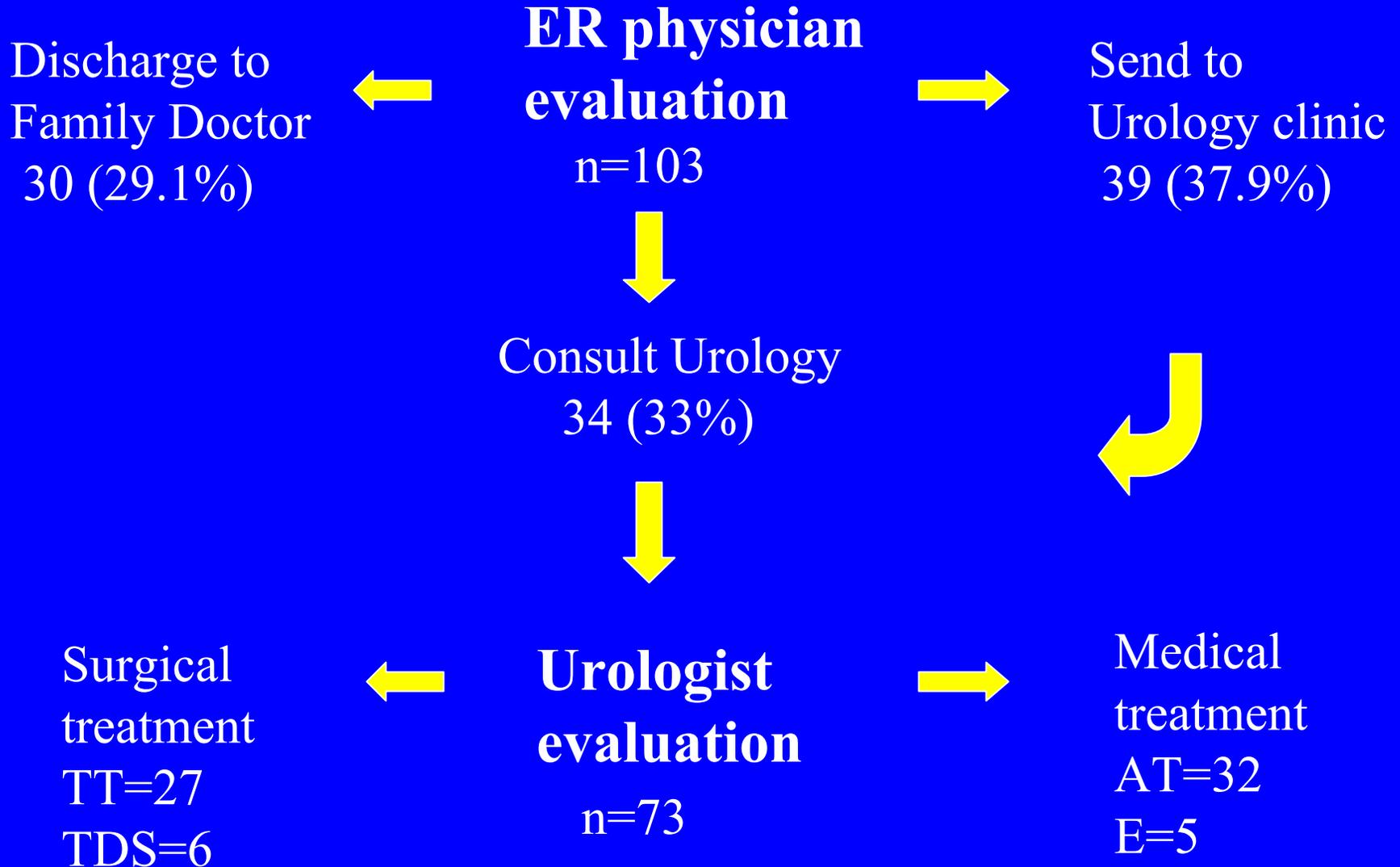
# Materials and methods

- Charts reviewed to determine “attributes” and final diagnosis
- Patients discharged to FP uncertain outcome
- If urology consult in ER or urology clinic appointment, attributes recorded compared to those of initial presentation

# Materials and methods

- Data mining
- Rough sets analysis
- Shapley fuzzy measures
- Decision rules

# Management Process in ER

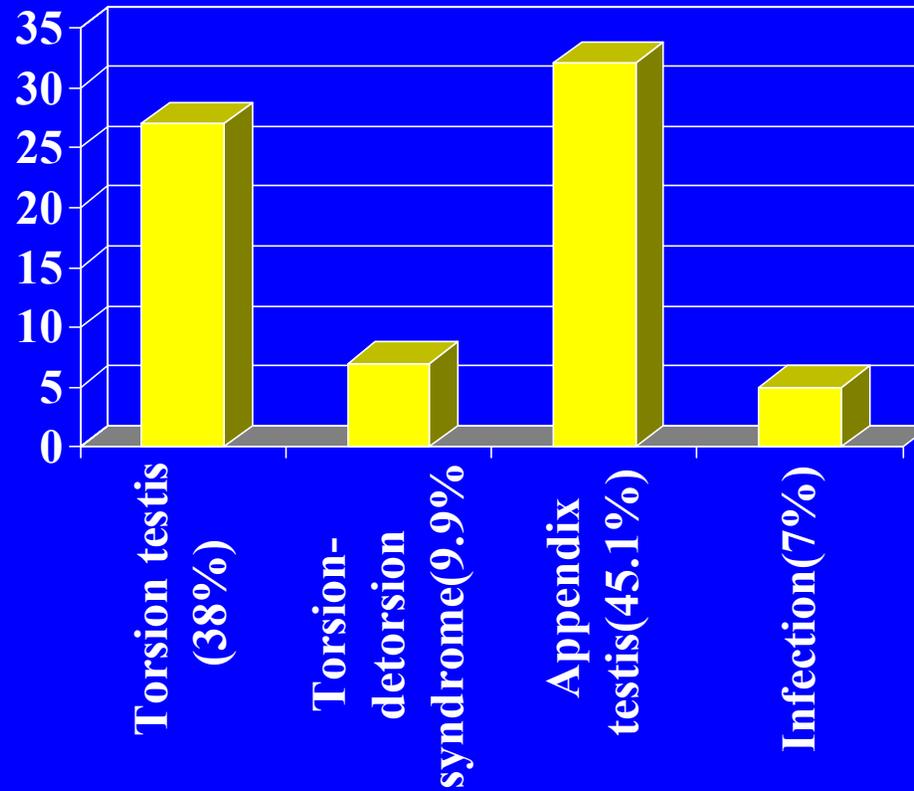


# Results

	<u>Code</u>	<u>Name</u>	<u>Most often evaluated by the ER physician</u>
•	1	Age	Age *
•	2	PainOnset	Onset of pain *
•	3	PainSite	Location of pain *
•	4	PainType	Type of pain *
•	5	Vomiting	Did vomiting occur? *
•	6	Swelling	Swelling
•	7	TesTend	Testis tenderness *
•	8	Cord	Cord palpable
•	9	Lie	Lie
•	10	Reflex	Cremasteric reflex
•	11	WBCC	White blood cell count
•	12	Tempr	Temperature in Celsius degrees *
•	13	WBCS	WBCS/HPF *

# Final diagnosis (urology)

N=73



palm

m515

**Patient**

**Doe, John**

**Hx** History

PE Ix TR

Site of pain: ▼ Right

Onset of pain: Acute  Grad

Type of pain: Const  Inter

Vomiting: Yes  No

Main



abc

123

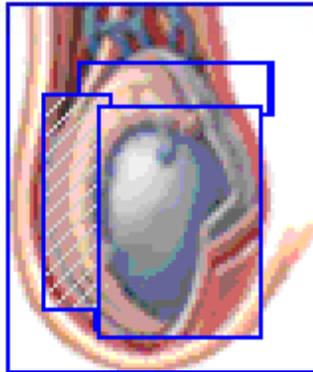


palm

m515

### Site of Tenderness

Site: ▼ Posterior



Done

Clear



abc



123



palm

m515

**Patient**

**Doe, John**

**Hx PE Lx TR Triage**

**Triage:** Clinic (strong)



Discharge:  weak

Clinic:  strong

Consult: |

Main



abc

123



# Protocol vs “Gold standard”

<u>Measure</u>	<u>Doppler*</u>	<u>Protocol</u>
Sensitivity	88.9%	75.7%
Specificity	98.8%	76.5%

\* Blaivis et al Am J  
Emerg Med, 2000

# Discussion

- Conflicting data and certainty of “final diagnosis” problematic
- Decision generally made on set of 8 attributes
- Something missing? (other attributes, clinical acumen, experience)
- Acquisition of complete data likely improved

# Conclusions

- Common attributes evaluated in boys with scrotal pain
- Protocol for computer implementation developed
- May aid in earlier triage of patients
- Initial results warrant prospective study in the ER