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## How Best To Characterize The Hypospadias Phenotype?

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## 2016

- No widely accepted standardized method for evaluating or describing hypospadias phenotypes
- Terms such as "distal" and "proximal" are not always uniformly applied
- To date, we still do not have a criteria for what constitutes "severe" hypospadias

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## Spoiler Alert

- I Don't Know (But do not feel bad about it)
- Based on review of literature: No one does

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## Lord Kelvin (1883)

"...when you cannot measure it, when you cannot *express it in numbers*, your knowledge is of a meager and unsatisfactory kind."

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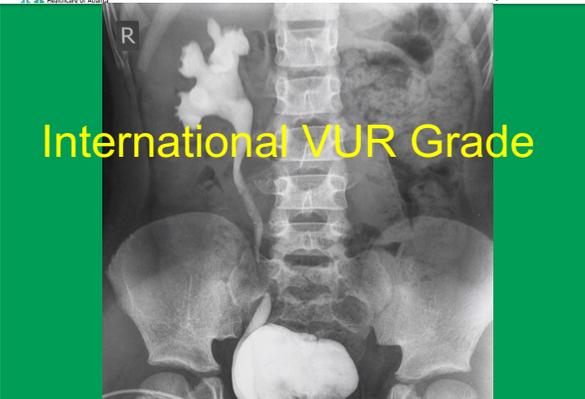
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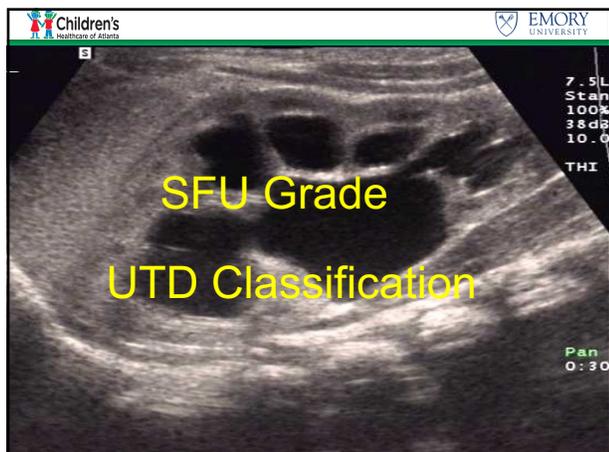
## GLEASON SCORE

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## International VUR Grade



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### List Goes On and On...

- Facial/pelvic Fractures
- ASA Anesthesia Classification
- AHA Heart failure Classification
- Nearly every cancer (i.e. Stage 1, 2, etc.)
- Even a grading system for Hemorrhoids...

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### Point it Obvious...

- One of the most common anomalies (~1/200)
- Hundreds of repair types
- Surgical outcomes vary drastically
- Why?

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### Specialty has not yet reached a point where...

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### Meatal position

Smith 1938	Chaefer 1950	Avellan 1975	Browne 1938	Duckett 1996	New 2003
1st degree	Glanular	Glanular	Glanular Sub-coronal	Glanular Sub-coronal Distal penile	Glanular Anterior Distal
2nd degree	Penile	Penile	Mid shaft	Mid shaft Proximal penile	Middle Proximal
3rd degree	Perineal Perineal w/o Bulb	Perineal	Penoscrotal Midsrotal Perineal	Penoscrotal Scrotal Perineal	Posterior Proximal

Fig: Classifications of hypospadias (From Hadidi AT, Azmy AF; Hypospadias Surgery: An Illustrated Guide, Heidelberg: Springer Verlag 2004.)

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### Meatal position

**IS THIS REALLY ~80 YEARS OF PROGRESS??**

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### What's wrong with this?

- Hypospadias occurs as a *complex* and includes features other than an abnormally positioned meatus
- Meatal position is a key feature, but not the only one
- Variation in urethral plate quality and configuration
- Variation in severity of chordee
- Decreased size
- Not expressed in numbers (i.e. you cannot average descriptive terms)

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### Ideal System

- Assess entire complex
- Numeric
- Simple/Fast
- Reproducible/objective

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### GMS Criteria and Representative Photos

G, M, and S scores summed to give GMS score (range 3 to 12)

<p><b>Glans (G) Score:</b></p> <ol style="list-style-type: none"> <li>Glans good size; healthy urethral plate, deeply grooved</li> <li>Glans adequate size; adequate urethral plate, grooved</li> <li>Glans small in size; urethral plate narrow, some fibrosis or flat</li> <li>Glans very small; urethral plate indistinct, very narrow or flat</li> </ol> <p><b>Meatus (M) Score:</b></p> <ol style="list-style-type: none"> <li>Glanular</li> <li>Coronal Sulcus</li> <li>Mid or Distal Shaft</li> <li>Proximal shaft, penoscrotal</li> </ol> <p><b>Shaft (S) Score:</b></p> <ol style="list-style-type: none"> <li>No chordee</li> <li>Mild (&lt;30°) chordee</li> <li>Moderate (30 - 60°) chordee</li> <li>Severe (&gt; 60°) chordee</li> </ol>	
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### GMS Score

- Pros:**
  - Simple/fast
  - Reproducible (at our institution)
  - Numeric
  - Correlates with outcomes
- Cons:**
  - Criticized for subjectivity (Surgeons eye more accurate than the ruler)
  - We don't yet know which features of the hypospadias complex are important (i.e. Glans size, Chordee, Urethral Plate)
  - Based on pre-op assessment (prior to de-gloving)

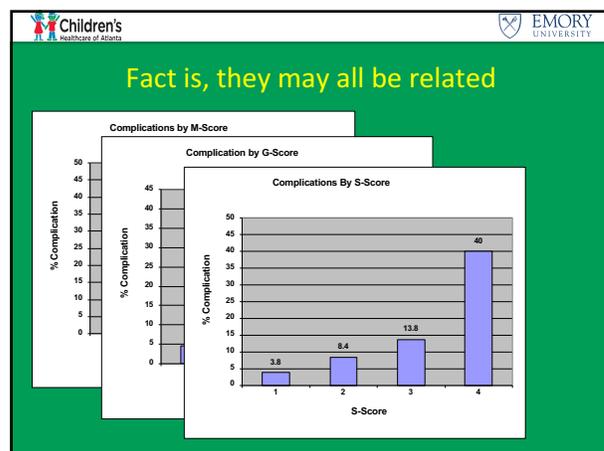
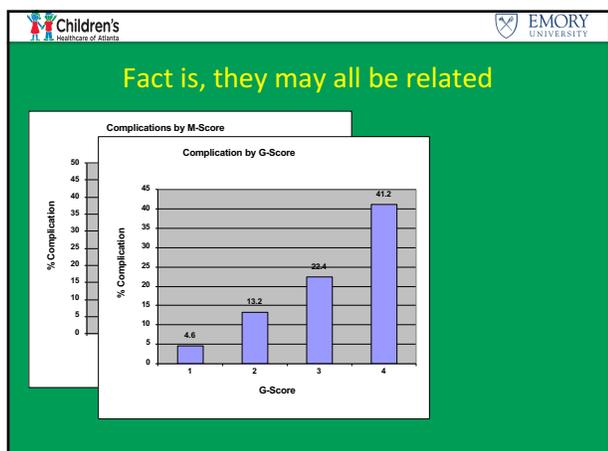
Hypospadias is an ART

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### Fact is, they may all be related

Complications by M-Score

M-Score	% Complication
1	1.9
2	8.7
3	23.1
4	30.7



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### Fact is, they may all be related

Patients with more proximal meatus tend to have smaller glans, poorer quality urethral plates, and more chordee

Potentially anyone of these may be a surrogate for the other?

Or maybe a score that includes all features could be synergistically more valuable

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### More work to be done

- Many unanswered questions
- Hypospadiology would greatly benefit from a universal numerical language to describe the anomaly
- Only then will we be able to begin answering important questions

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### Thank You

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