

In vitro evaluation of a novel pediatric flexible cystoscope - A practical comparison of endoscopes for pediatric lower urinary tract evaluation

Hong Truong, Victor Kucherov*, Jennifer Hagerty, Jose Rosado, Scott Hubosky, Demetrius Bagley

Disclosure

- Scientific advisor: Bard, Olympus/ACMI, Cook

Background

- Cystoscopic evaluation of the pediatric lower urinary tract presents unique anatomic challenges
 - Urethral size
 - Lower urinary tract reconstructions
 - Ability to tolerate cystoscopic evaluation (need for anesthesia)
- There is no well-established flexible cystoscope designed specifically for the pediatric population

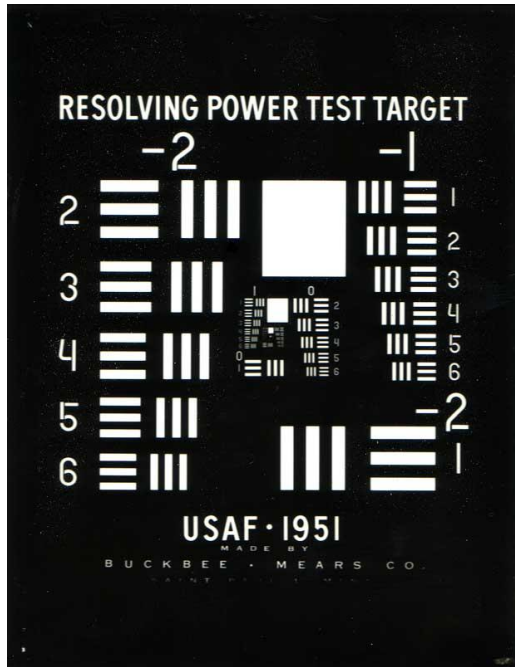
Background

- Neoflex pediatric flexible cystoscope (Neoscope, USA)
 - Single-use flexible cystoscope designed for pediatric population
 - FDA-approved
 - No formal comparison to other endoscopes widely used in pediatric urology

Purpose/methods

- Compare parameters of endoscopes for pediatric cystoscopy
 - Gyrus ACMI MRA-715A semirigid ureteroscope (Olympus, USA)
 - Adult flexible cystoscope (Karl-Storz, Germany)
 - Flex-X^{2S} flexible ureteroscope (Karl-Storz, Germany)
 - Neoflex pediatric flexible cystoscope (Neoscope, USA)
- Multiple technical factors
 - Basic construction/functional parameters
 - Resolution and color

Resolution and color



1951 USAF test pattern



Gretag-Macbeth color check

Neoflex pediatric flexible cystoscope



Basic endoscope parameters

	Gyrus ACMI	Adult cysto	Flex-X ^{2S}	<u>Neoflex</u>
<u>Length</u> (mm)	150	370	670	170
<u>Shaft diameter</u> (Fr)	9.2	15	7.5	8.6
<u>Working channel</u> (Fr)	5.4	6.9	3.6	3.6
<u>Field of view</u> (degrees)	40	80	75	85
<u>Deflection: empty</u> Degrees, down/up/total	-	80/85/165	140/136/275	<u>150/140/290</u>
<u>Def, 0.035" guidewire</u> Degrees, down/up/total	-	60/80/140	70/85/155	<u>90/95/180</u>



Optics (tested at 10, 20, 50 mm)

	Gyrus ACMI	Adult cysto	Flex-X ^{2S}	Neoflex
<u>Resolution (20 mm)</u> 1951 USAF test pattern	2.248	1.403	1.319	<u>2.956</u>
<u>Color (20 mm)</u> Gretag-Macbeth color check	<u>2.0</u>	1.9	1.8	1.2



Summary

- Neoflex pediatric flexible cystoscope (Neoscope, USA) has favorable parameters for pediatric cystoscopy
 - Made for children with pediatric-appropriate design parameters
 - Flexible, single-use format
 - Better field of view/deflection/resolution
 - Can connect to laptop via dongle or to typical endoscope tower
- Further study
 - Clinical trial, identify ideal use/setting
 - Cost analysis
 - Potential office/floor use
 - [Collaboration: victor.kuchеров@jefferson.edu](mailto:victor.kuchеров@jefferson.edu)

