Collaborating to Improve Epilepsy Surgical Care in Children:
The Pediatric Epilepsy Research Consortium (PERC) Surgery Subgroup

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Introduction

The Pediatric Epilepsy Research Consortium (PERC) is a network of US pediatric epilepsy centers providing infrastructure to facilitate collegial, collaborative, practice-changing research that delivers answers needed to improve the care of children with epilepsy. The Epilepsy Surgery Subgroup was formed in 2018 to characterize the use of pediatric epilepsy surgery in the US and define current practices for candidate selection and treatment. We describe the program characteristics of participating member institutions.

Methods

- Cross sectional survey of pediatric surgery experience at epilepsy centers in the PERC Epilepsy Surgery Subgroup
- Survey included questions related to program participants, technologies, and evaluation methods.
- Survey disseminated via Qualtrics.
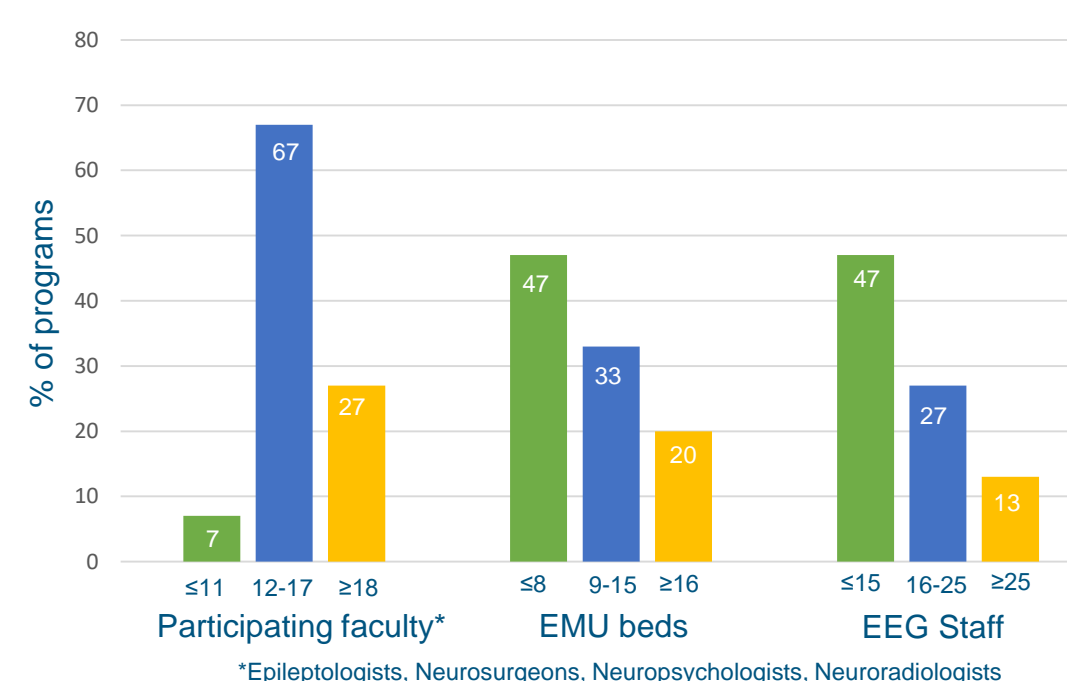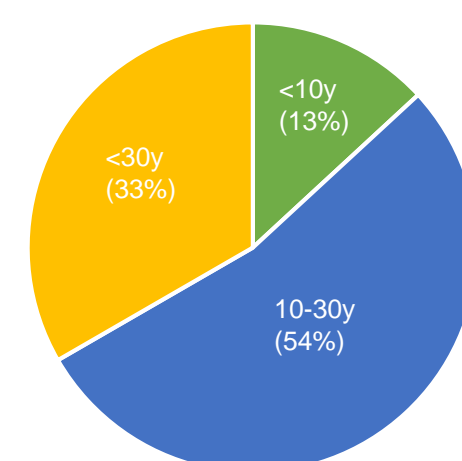- Data presented using descriptive statistics

Results

Program Characteristics

N=14 of 18 member institutions responded (83%)
- Academic: 12 (86%), Hybrid 2 (14%)
- Freestanding children's hospital: 11 (79%)
- NAEC accreditation: 13 (93%), all Level 4

Years of Experience

Pie chart: <10y (13%), 10-30y (54%), <30y (33%)

Bar chart (% of programs):
Participating faculty*: ≤11 = 7, 12-17 = 67, ≥18 = 27
EMU beds: ≤8 = 47, 9-15 = 33, ≥16 = 20
EEG Staff: ≤15 = 47, 16-25 = 27, ≥25 = 13

*Epileptologists, Neurosurgeons, Neuropsychologists, Neuroradiologists

Technology	N (%)	ECOG used routinely	N (%)
VEEG, 3T MRI, PET, SPECT	14 (100)	Yes	10 (71)
		No	4 (29)
Additional Technologies		**Invasive EEG**	
MEG	13 (92)	Strips	13 (93)
TMS	4 (29)	Grids	14 (100)
Intra-op MRI	9 (64)	SEEG	13 (93)
Image post-processing	12 (86)	Combined	13 (93)
EEG Source Localization	7 (50)		
Surgical robotics	12 (86)		

Abbreviations: VEEG=video electroencephalogram; EMU=epilepsy monitoring unit; MRI=magnetic resonance imaging; PET=positron emission tomography; SPECT=single photon emission computed tomography; ECOG=electrocorticography; MEG=magnetoencephalogram; iMRI=intraoperative MRI; TMS=transcranial magnetic stimulation; SEEG=stereo-electroencephalography

Database Snapshot

- 311 patients enrolled
- Age at Evaluation: 10.1 y (0.3-19.8)
- Surgery completed: 121 (39%)

Etiology
(could have > 1 etiology)
- Structural (congenital): 117, 37.5%
- Structural (acquired): 80, 25.6%
- Unknown: 87, 27.9%
- Genetic: 25, 8%
- Other: 7, 2.2%
- Autoimmune/inflammatory: 6, 1.9%
- Infectious: 5, 1.6%

Surgery Type
(could have > 1 procedure)
- Lobectomy: 37, 31.9%
- Lesionectomy: 37, 31.9%
- Hemispherectomy: 13, 11.2%
- Other: 7, 6%
- Neuromodulation: 11, 9.5%
- Thermal ablation: 10, 8.6%
- Callosotomy: 6, 5.2%

Conclusions

- The PERC Epilepsy Surgery Subgroup represents a unique opportunity to collect significant data on multiple aspects of epilepsy surgery in the US.
- Participating programs differ in size, experience, and methods and technologies utilized in evaluation.
- Meaningful comparison between centers will better define best practices for candidate selection, evaluation, and treatment.

Pediatric Epilepsy RESEARCH CONSORTIUM