The Top 100 Most Cited Journal Articles in Pediatric Neurosurgery

Viktoriya Grayson, Mitchell W. Couldwell, Esther Dupepe, Joe Iwanaga, CJ Bui, Aaron S. Dumont, R. Shane Tubbs

1. Department of Neurosurgery, Tulane University School of Medicine, New Orleans, USA 2. Department of Pediatric Neurosurgery, Ochsner Louisiana State University Health, New Orleans, USA 3. Department of Neurology, Tulane University School of Medicine, New Orleans, USA 4. Department of Neurosurgery, Ochsner Neuroscience Institute, Ochsner Health System, New Orleans, USA 5. Anatomical Sciences, St. George’s University, St. George’s, GRD

Abstract

With the many papers published in the field of pediatric neurosurgery, it is often difficult to recognize those that have the most impact on future papers, i.e., citable papers. However, citation analysis allows one to better understand which papers are impacting the field the most. Therefore, the current study aimed to evaluate this literature. The Journal Citation Report database was searched for publications with the words "pediatric neurosurgery" or "pediatric neuro" in the title. Using the Web of Science Core Collection, the top 100 journal articles in pediatric neurosurgery from the selected journals were identified and citation analysis was used to identify the most impactful articles. A search was performed on Web of Science Core Collection by searching for each journal under "Publication Name" and using the Boolean "OR" function to separate fields. The results were ordered by the "Times Cited" category, which provided a list of all the articles from the eight journals appearing in the most cited order. The timeline used was from 1976 to 2021. The top 100 most cited articles were extracted from this list for analysis. The following variables were collected from each scientific article: publication journal, impact factor of journal, title, number of citations, year and month of publication, and type of article. Eight journals were identified on the basis of our search criteria and the articles were sorted by most cited; 1609 pediatric neurosurgery journal articles were screened to evaluate this literature. The Journal Citation Report database was searched for publications with the words "pediatric neurosurgery" or "pediatric neuro" in the title. Using the Web of Science Core Collection, the top 100 journal articles in pediatric neurosurgery from the selected journals were identified and citation analysis was used to identify the most impactful articles. A search was performed on Web of Science Core Collection by searching for each journal under "Publication Name" and using the Boolean "OR" function to separate fields. The results were ordered by the "Times Cited" category, which provided a list of all the articles from the eight journals appearing in the most cited order. The timeline used was from 1976 to 2021. The top 100 most cited articles were extracted from this list for analysis. The following variables were collected from each scientific article: publication journal, impact factor of journal, title, number of citations, year and month of publication, and type of article. Eight journals were identified on the basis of our search criteria and the articles were sorted by most cited; 1609 pediatric neurosurgery journal articles were screened to select the 100 most cited since 1976. This compilation could serve to help clinicians and researchers to familiarize themselves with the journal articles included in terms of study type, study field, journal of publication, and recurring authors.

Categories: Pediatric Surgery, Neurosurgery
Keywords: category, citation, journal, publication, pediatric neurosurgery

Introduction And Background

There are many journal articles published on pediatric neurosurgery; a way to analyse and compare these publications is using citation analysis. The first scientific database for citation tracking was developed by the Institute for Scientific Information in 1962, later combined with the Social Sciences Citation Index in 1973 and the Arts and Humanities Citation Index in 1978. In 1997, this database was presented online under the name Web of Science. Later, it was rebranded under the name Web of Science Core Collection and was supplemented by many more citation indexes to maintain continual systematic updating of citation counts for journal articles [1]. The massive growth of medical and biological publications during this information era has led to new ways of assessing and systematically reviewing the impact of individual publications on a field of interest [2,3]. Thus, within the past two decades, there has been an influx of articles using citation index methods to evaluate the most relevant work within specific fields such as neurosurgery [1,4], plastic surgery [5], dermatology [6], orthopedic surgery [7], and others [8,9]. This review presents the 100 most highly cited journal articles in pediatric neurosurgery selected from eight journals using citation data accessed from the Web of Science Core Collection.

Review Methods

The focus of this study was to identify journal articles specifically dedicated to pediatric neurosurgery. Using similar methods as used by Ponce and Lozano, we identified eight journals by searching the Journal Citation Report database for publications with the words "pediatric neurosurgery" or "pediatric neuro" in the title [1,4]. The chosen journals were Child’s Brain, Pediatric Neurosurgery, Child’s Nervous System, Journal of Pediatrics, Journal of Neurosurgery, Journal of Neurosurgery-Pediatrics, Neurpeditics, and Neurosurgery. A search was then performed on the Web of Science Core Collection database by searching for each journal under “Publication Name” and using the Boolean "OR" function to separate fields. The results were ordered by the "Times Cited" category, which provided a list of all the articles from the eight journals appearing in the most cited order. The timeline used was from 1976 to 2021. The top 100 most cited articles were extracted from this list for analysis. The following variables were collected from each scientific article: publication journal, impact factor of journal, title, number of citations, year and month of publication, and type of article. Eight journals were identified on the basis of our search criteria and the articles were sorted by most cited; 1609 pediatric neurosurgery journal articles were screened to select the 100 most cited since 1976. This compilation could serve to help clinicians and researchers to familiarize themselves with the journal articles included in terms of study type, study field, journal of publication, and recurring authors.
article: publication journal, impact factor of journal, title, number of citations, year and month of publication, and type of article. Articles were excluded if they included basic science research, or animal studies, or were not purely pediatric or related to neurosurgery (i.e., they included adults or were not related to pediatric neurosurgery). The pediatric population was defined as ages 0-18 years as referenced in the articles. There were two exceptions to the age limit in the articles selected for review: in the study by Grant et al., the age limit was 21 (range 6 months to 21 years, with a mean of 10.4 ± 0.5 years), and in that by Tubbs et al., the age of patients ranged from 2 months to 20 years with a mean of 11 years [10,11].

Sources and citations

Eight journals were identified on the basis of the criteria described in Methods and the articles were sorted by most cited; 1609 pediatric neurosurgery journal articles were screened to select the 100 most cited articles since 1976 (Table 1).

| Name of journal               | Impact factor |
|-------------------------------|---------------|
| Child's Brain                 | 0.985         |
| Child's Nervous System        | 1.475         |
| Journal of Neurosurgery       | 5.115         |
| Journal of Neurosurgery-Pediatrics | 2.375    |
| Journal of Pediatrics         | 4.113         |
| Neuropediatrics               | 1.947         |
| Neurosurgery                  | 3.968         |
| Pediatric Neurosurgery        | 0.985         |

TABLE 1: 2020 impact factors of selected journals

From these 100, 49 were published in Journal of Neurosurgery, 20 in Journal of Pediatrics, 17 in Neurosurgery, five in Pediatric Neurosurgery, four in Child's Nervous System, two in Neuropediatrics, two in Journal of Neurosurgery-Pediatrics, and one in Child's Brain (Table 2).

| Rank | Citations | Article                                                                 | Journal | Year of publication |
|------|-----------|------------------------------------------------------------------------|---------|---------------------|
| 1    | 4225      | Papile LA, Burstein J, Burstein R, Koffler H. Incidence and evolution of subependymal and intraventricular hemorrhage: a study of infants with birth weights less than 1,500 gm. J Pediatr. 1978;92(4):529-534. doi: 10.1016/s0022-3476(78)80282-0 | Journal of Pediatrics | 1978               |
| 2    | 593       | Lou HC, Lassen NA, Fries-Hansen B. Impaired autoregulation of cerebral blood flow in the distressed newborn infant. J Pediatr. 1979;94(1):118-121. doi: 10.1016/s0022-3476(79)80373-x | Journal of Pediatrics | 1979               |
| 3    | 556       | Daumas-Dupont C, Scheithauer BW, Chodkiewicz JP, Laws ER Jr, Vedrenne C. Dysembryoplastic neuroepithelial tumor: a surgically curable tumor of young patients with intractable partial seizures. Report of thirty-nine cases. Neurosurgery. 1988;23(5):545-556. doi: 10.1227/00006123-198811000-00002 | Neurosurgery | 1988               |
| 4    | 555       | Clarren SK, Alvord EC Jr, Sunmi SM, Streissguth AP, Smith DW. Brain malformations related to prenatal exposure to ethanol. J Pediatr. 1978;92(1):64-67. doi: 10.1016/s0022-3476(78)80072-9 | Journal of Pediatrics | 1978               |
| 5    | 548       | Rorke LB, Packer RJ, Biegel JA. Central nervous system atypical teratoid/rhabdoid tumors of infancy and childhood: definition of an entity. J Neurosurg. 1996;85(1):56-65. doi: 10.3171/jns.1996.85.1.0056 | Journal of Neurosurgery | 1996               |
| 6    | 478       | Duhaime AC, Gennarelli TA, Thibault LE, Bruce DA, Margulies SS, Wiser R. The shaken baby syndrome. A clinical, pathological, and biomechanical study. J Neurosurg. 1987;66(3):409-415. doi: 10.3171/jns.1987.66.3.0409 | Journal of Neurosurgery | 1987               |
| 7    | 463       | Drake JM, Kestle JR, Milner R, et al. Randomized trial of cerebrospinal fluid shunt valve design in pediatric hydrocephalus. Neurosurgery. 1998;43(2):294-305. doi: 10.1097/00006123-199808000-00088 | Neurosurgery | 1998               |
Papile LA, Munsick-Stuino G, Schaefer A. Relationship of cerebral intraventricular hemorrhage and early childhood neurologic handicaps. J Pediatr. 1983;103(2):273-277. doi: 10.1016/s0022-3476(83)80366-7

Evans AE, Jenkin RD, Sposto R, et al. The treatment of medulloblastoma. Results of a prospective randomized trial of radiation therapy with and without CCNU, vincristine, and prednisone. J Neurosurg. 1990;72(4):572-582. doi: 10.3171/jns.1990.72.4.0572

Bowman RM, McLone DG, Grant JA, Tomita T, Ito JA. Spina bifida outcome: a 25-year prospective. Pediatr Neurol. 2003;34(3):114-120. doi: 10.1159/000065005

Hoffman HJ, De Silva M, Humphreys RP, Drake JM, Smith ML, Blaser SI. Aggressive surgical management of craniopharyngiomas in children. J Neurosurg. 1992;76(1):47-52. doi: 10.3171/jns.1992.76.1.0047

Renier D, Sainte-Rose C, Marchac D, Hirsch JF. Intracranial pressure in craniosenosis. J Neurosurg. 1982;57(3):370-377. doi: 10.3171/jns.1982.57.3.0370

Packer RJ, Ater J, Allen J, et al. Carboplatin and vincristine chemotherapy for children with newly diagnosed progressive low-grade gliomas. J Neurosurg. 1997;86(5):747-754. doi: 10.3171/jns.1997.86.5.0747

Bruce DA, Alavi A, Bilaniuk L, Dolinskas C, Obrist W, Uzzell B. Diffuse cerebral swelling following head injuries in children: the syndrome of "malignant brain edema". J Neurosurg. 1981;54(2):170-178. doi: 10.3171/jns.1981.54.2.0170

Lovell MR, Collins MW, Iverson GL, et al. Recovery from mild concussion in high school athletes. J Pediatr. 2003;98(2):296-301. doi: 10.3171/jns.2003.98.2.0296

Inder TE, Wells SJ, Mogridge NB, Spencer C, Volpe JJ. Defining the nature of the cerebral abnormalities in the premature infant: a qualitative magnetic resonance imaging study. J Pediatr. 2003;142(3):171-179. doi: 10.1067/mpp.2003.30357-3

Scott RM, Smith JL, Robertson RL, Madsen JR, Soriano SG, Rockoff MA. Long-term outcome in children with moyamoya syndrome after cranial revascularization by pial synangiosis. J Neurosurg. 2004;100(2 Suppl Pediatrics):142-149. doi: 10.3171/2004.100.2.0142

Listernick R, Charrow J, Greenland M, Mets M. Natural history of optic pathway tumors in children with neurofibromatosis type 1: a longitudinal study. J Pediatr. 1994;125(1):63-66. doi: 10.1016/s0022-3476(94)80366-7

Pang D, Wilberger JE Jr. Spinal cord injury without radiographic abnormalities in children. J Neurosurg. 1982;57(1):114-129. doi: 10.3171/jns.1982.57.1.0114

Berger MS, Kincaid J, Ojemann GA, Lettich E. Brain mapping techniques to maximize resection, safety, and seizure control in children with brain tumors. Neurosurgery. 1989;25(5):786-792. doi: 10.1097/00006123-198911000-00015

Chasnoff IJ, Bussey ME, Savich R, Stack CM. Perinatal cerebral infarction and maternal cocaine use. J Pediatr. 1986;108(3):456-459. doi: 10.1016/s0022-3476(86)80396-4

Miller SP, Ramaswamy V, Michelson D, et al. Patterns of brain injury in term neonatal encephalopathy. J Pediatr. 2005;146(4):453-460. doi: 10.1016/j.jpeds.2004.12.026

Taylor A, Butt W, Rosenfeld J, et al. A randomized trial of very early decompressive craniectomy in children with traumatic brain injury and sustained intracranial hypertension. Childs Nerv Syst. 2001;17(3):154-162. doi: 10.1007/s0038100100410

Barkovich AJ, Kuzniecky RI, Dobyns WB, Jackson GD, Becker LE, Evrard P. A classification scheme for malformations of cortical development. Neuropediatrics. 1996;27(2):59-63. doi: 10.1055/s-2007-973750

Miller SP, Ferriero DM, Leonard C, et al. Early brain injury in premature newborns detected with magnetic resonance imaging is associated with adverse early neurodevelopmental outcome. J Pediatr. 2005;147(5):609-616. doi: 10.1016/j.jpeds.2005.06.033

Collins MW, Lovell MR, Iverson GL, Cantu RC, Maroon JC, Field M. Cumulative effects of concussion in high school athletes. Neurosurgery. 2002;51(5):1175-1181. doi: 10.1097/00006123-200205000-00022
| Page | Article ID | Authors | Title | Journal | Year |
|------|------------|---------|-------|---------|------|
| 28   | 301        | Sainte-Rose C, Piatt JH, Renier D, et al. | Mechanical complications in shunts. | Pediatric Neurosurgery | 1992 |
| 29   | 296        | Bruce DA, Schut L, Bruno LA, Wood JH, Sutton LN. | Outcome following severe head injuries in children. | Journal of Neurosurgery | 1978 |
| 30   | 286        | Jones RF, Stening WA, Brydson M. | Endoscopic third ventriculostomy. | Neurosurgery | 1992 |
| 31   | 285        | Balkaran B, Char G, Morris JS, Thomas PW, Serjeant BE, Serjeant GR. | Stroke in a cohort of patients with homozygous sickle cell disease. | Journal of Pediatrics | 1992 |
| 32   | 282        | Barlow CF, Priebe CJ, Mulliken JB, et al. | Spastic diplegia as a complication of interferon alfa-2a treatment of hemangiomas of infancy. | Journal of Pediatrics | 1998 |
| 33   | 280        | Hoffman HJ, Otsubo H, Hendrick EB, et al. | Intracranial germ-cell tumors in children. | Journal of Neurosurgery | 1992 |
| 34   | 276        | Rickert CH, Paulus W. | Epidemiology of central nervous system tumors in childhood and adolescence based on the new WHO classification. | Child's Nervous System | 2001 |
| 35   | 267        | Hoffman HJ, Hendrick EB, Humphreys RP. | The tethered spinal cord: its protein manifestations, diagnosis and surgical correction. | Child's Brain | 1976 |
| 36   | 265        | Keelie J, Drake J, Milner R, et al. | Long-term follow-up data from the Shunt Design Trial. | Pediatric Neurosurgery | 2000 |
| 37   | 265        | Choux M, Genitori L, Lang D, Lena G. | Shunt implantation: reducing the incidence of shunt infection. | Journal of Neurosurgery | 1992 |
| 38   | 261        | Packer RJ, Sutton LN, Atkins TE, et al. | A prospective study of cognitive function in children receiving whole-brain radiotherapy and chemotherapy: 2-year results. | Journal of Pediatrics | 1989 |
| 39   | 255        | Pollack IF, Polinck P, Albright AL, Towbin R, Fitz C. | Mutism and pseudobulbar symptoms after resection of posterior fossa tumors in children: incidence and pathophysiology. | Neurosurgery | 1995 |
| 40   | 254        | Albright AL, Packer RJ, Zimmerman R, Ronke LB, Boyett J, Hammond GD. | Magnetic resonance scans should replace biopsies for the diagnosis of diffuse brain stem gliomas: a report from the Children's Cancer Group. | Neurosurgery | 1993 |
| 41   | 252        | Park TS, Hoffman HJ, Hendrick EB, Humphreys RP, Becker LE. | Medulloblastoma: clinical presentation and management. Experience at the hospital for sick children, Toronto, 1950-1980. | Journal of Neurosurgery | 1983 |
| 42   | 251        | Pegelow CH, Adams RJ, McKie V, et al. | Risk of recurrent stroke in patients with sickle cell disease treated with erythrocyte transfusions. | Journal of Pediatrics | 1995 |
| 43   | 250        | Maalouf EF, Duggan PJ, Rutherford MA, et al. | Magnetic resonance imaging of the brain in a cohort of extremely preterm infants. | Journal of Pediatrics | 1999 |
| 44   | 247        | Puget S, Garnett M, Wray A, et al. | Pediatric craniopharyngiomas: classification and treatment according to the degree of hypothalamic involvement. | Journal of Neurosurgery | 2007 |
| 45   | 244        | Matsushima T, Inoue T, Suzuki SO, Fujii K, Fukui M, Hasuo K. | Surgical treatment of moyamoya disease in pediatric patients—comparison between the results of indirect and direct revascularization procedures. | Neurosurgery | 1992 |
| 46   | 238        | Robertson PL, Zeltzer PM, Boyett JM, et al. | Survival and prognostic factors following radiation therapy and chemotherapy for ependymomas in children: a report of the Children's Cancer Group. | Journal of Neurosurgery | 1998 |
Glass HC, Glidden D, Jeremy RJ, Barkovich AJ, Ferreiro DM, Miller SP. Clinical neonatal seizures are independently associated with outcome in infants at risk for hypoxic-ischemic brain injury. J Pediatr. 2009;155(3):318-323. doi: 10.1016/j.peds.2009.03.040

Kulkarni AV, Drake JM, Lamberti-Pasculli M. Cerebrospinal fluid shunt infection: a prospective study of risk factors. J Neurosurg. 2001;94(2):195-201. doi: 10.3171/jns.2001.94.2.0195

Cinalli G, Sainte-Rose C, Chumas P, et al. Failure of third ventriculostomy in the treatment of aqueductal stenosis in children. J Neurosurg. 1999;90(3):448-454. doi: 10.3171/jns.1999.90.3.0448

Ellenberg L, McComb JG, Siegel SE, Stowe S. Factors affecting intellectual outcome in pediatric brain tumor patients. Neurosurgery. 1987;21(5):638-644. doi: 10.1227/00006123-198711000-00006

Pollack IF, Gerszten PC, Martinez AJ, et al. Intracranial ependymomas of childhood: long-term outcome and prognostic factors. Neurosurgery. 1995;37(4):655-667. doi: 10.1227/00006123-199510000-00008

Bada HS, Hajar W, Chua C, Sumner DS. Noninvasive diagnosis of neonatal asphyxia and intraventricular hemorrhage by Doppler ultrasound. J Pediatr. 1979;95(5 Pt 1):775-779. doi: 10.1016/s0022-3476(79)80735-0

De Vle C, Grant DB, Kendall BE, et al. Management of childhood craniohypophyrgicoma: can the morbidity of radical surgery be predicted? J Neurosurg. 1996;85(1):73-81. doi: 10.3171/jns.1996.85.1.0073

Hadley MN, Zabramski JM, Browner CM, Rekate H, Sonntag VK. Pediatric spinal trauma. Review of 122 cases of spinal cord and vertebral column injuries. J Neurosurg. 1988;68(1):18-24. doi: 10.3171/jns.1988.68.1.0018

Renier D, Lajeunie E, Arnaud E, Marchac D. Management of craniosynostoses. Childs Nerv Syst. 2000;16(10-11):645-658. doi: 10.1007/s003810000320

Tuli S, Drake J, Lawless J, Wigg M, Lamberti-Pasculli M. Risk factors for repeated cerebrospinal shunt failures in pediatric patients with hydrocephalus. J Neurosurg. 2000;92(1):31-38. doi: 10.3171/jns.2000.92.1.0031

Epstein F, McClearly EL. Intrinsic brain-stem tumors of childhood: surgical indications. J Neurosurg. 1986;64(1):11-15. doi: 10.3171/jns.1986.64.1.0011

Grant GA, Jolley M, Ellenbogen RG, Gruss JR, Loeser JD. Failure of autologous bone-assisted cranioplasty following decompressive craniectomy in children and adolescents. J Neurosurg. 2004;100(2 Suppl Pediatrics):163-168. doi: 10.3171/ped.2004.100.2.0163

Adelson PD, Ragheb J, Kanev P, et al. Phase II clinical trial of moderate hypothermia after severe traumatic brain injury in children. Neurosurgery. 2000;93(2 Suppl):183-193. doi: 10.1227/01.neu.0000056471.50726.26

Moser RS, Schatz P, Jordan BD. Prolonged effects of concussion in high school athletes. Neurosurgery. 2005;57(2):300-306. doi: 10.1227/01.neu.0000166663.98616.e4

Nazar GB, Hoffman HJ, Becker LE, Jenkin D, Humphreys RP, Hendrick EB. Infratentorial ependymomas in childhood: prognostic factors and treatment. J Neurosurg. 1990;72(3):408-417. doi: 10.3171/jns.1990.72.3.0408

VandenBerg SR, May EE, Rubinstein LJ, et al. Desmoplastic supratentorial neuroepithelial tumors of infancy with divergent differentiation potential ("desmoplastic infantile gangliogliomas"). Report on 11 cases of a distinctive embryonal tumor with favorable prognosis. J Neurosurg. 1987;66(1):58-71. doi: 10.3171/jns.1987.66.1.0058

Albright AL, Wisoff JH, Zeltzer PM, Boyett JM, Rorke LB, Stanley P. Effects of medulloblastoma resections on outcome in children: a report from the Children's Cancer Group. Neurosurgery. 1996;38(2):265-271. doi: 10.1097/00006123-199602000-00007
66 206 O'Heyon BB, Drake JM, Ozaip MG, Tuli S, Clarke M. Frontal and occipital horn ratio: A linear estimate of ventricular size for multiple imaging modalities in pediatric hydrocephalus. Pediatr Neurosurg. 1998;29(5):245-249. doi: 10.1159/000028730

Pediatric Neurosurgery 1998

67 204 Pierre-Kahn A, Zerah M, Renier D, et al. Congenital lumbosacral lipomas. Childs Nerv Syst. 1997;13(6):298-335. doi: 10.1007/s003810050090

Child's Nervous System 1997

68 204 Edwards MS, Hudgins RJ, Wilson CB, Levin VA, Wara WM. Pineal region tumors in children. J Neurosurg. 1988;68(5):689-697. doi: 10.3171/jns.1988.68.5.0689

Journal of Neurosurgery 1988

69 199 Robertson PL, Muraszko KM, Holmes EJ, et al. Incidence and severity of postoperative cerebellar multismut syndrome in children with medulloblastoma: a prospective study by the Children's Oncology Group. J Neurosurg. 2006;105(6 Suppl):444-451. doi: 10.3171/ped.2006.105.6.444

Journal of Neurosurgery 2006

70 198 Hirschi JF, Pierre-Kahn A, Renier D, Sainte-Rose C, Hoppe-Hirschi E. The Dandy-Walker malformation. A review of 40 cases. J Neurosurg. 1984;61(3):515-522. doi: 10.3171/jns.1984.61.3.0515

Journal of Neurosurgery 1984

71 194 Wisoff JH, Boyett JM, Berger MS, et al. Current neurosurgical management and the impact of the extent of resection in the treatment of malignant gliomas of childhood: a report of the Children's Cancer Group trial no. CCG-945. J Neurosurg. 1998;89(1):52-59. doi: 10.3171/jns.1998.89.1.0052

Journal of Neurosurgery 1998

72 194 Teo C, Jones R. Management of hydrocephalus by endoscopic third ventriculostomy in patients with myelomeningocele. Pediatr Neurosurg. 1996;25(2):57-63. doi: 10.1159/000121098

Pediatric Neurosurgery 1996

73 194 Perlman JM, Hill A, Volpe JJ. The effect of patent ductus arteriosus on flow velocity in the anterior cerebral arteries: ductal steal in the premature newborn infant. J Pediatr. 1981;99(5):767-771. doi: 10.1016/s0022-3476(81)80408-8

Journal of Pediatrics 1981

74 194 Hoffman HJ, Taecholam C, Hendrick EB, Humphreys RP. Management of lipomyelomeningoceles. Experience at the Hospital for Sick Children, Toronto. J Neurosurg. 1985;62(1):1-8. doi: 10.3171/jns.1985.62.1.0001

Journal of Neurosurgery 1985

75 193 Bada HS, Korones SB, Perry EH, et al. Mean arterial blood pressure changes in premature infants and those at risk for intraventricular hemorrhage. J Pediatr. 1990;117(4):607-614. doi: 10.1016/s0022-3476(05)80700-0

Journal of Pediatrics 1990

76 192 Keucher TR, Mealey J Jr. Long-term results after ventriculocisternal and ventriculoperitoneal shunting for infantile hydrocephalus. J Neurosurg. 1979;50(2):179-186. doi: 10.3171/jns.1979.50.2.0179

Journal of Neurosurgery 1979

77 191 Harsh GR 4th, Edwards MS, Wilson CB. Intracranial arachnoid cysts in children. J Neurosurg. 1986;64(6):835-842. doi: 10.3171/jns.1986.64.6.0835

Journal of Neurosurgery 1986

78 189 Wart BC. Comparison of endoscopic third ventriculostomy alone and combined with choroidal plexus cauterization in infants younger than 1 year of age: a prospective study in 550 African children. J Neurosurg. 2005;103(6 Suppl):475-481. doi: 10.3171/ped.2005.103.6.0475

Journal of Neurosurgery 2005

79 187 Jimenez DF, Barone CM. Endoscopic craniectomy for early surgical correction of sagittal craniosynostosis. J Neurosurg. 1998;88(1):77-81. doi: 10.3171/jns.1998.88.1.0077

Journal of Neurosurgery 1998

80 187 Muizelaar JP, Marmarou A, DeSalles AA, et al. Cerebral blood flow and metabolism in severely head-injured children. Part 1: Relationship with GCS score, outcome, ICP, and PVI. J Neurosurg. 1997;81(1):63-71. doi: 10.3171/jns.1997.81.1.0083

Journal of Neurosurgery 1997

81 184 Ciricillo SF, Cogen PH, Harsh GR, Edwards MS. Intracranial arachnoid cysts in children. A comparison of the effects of fenestration and shunting. J Neurosurg. 1991;74(2):230-235. doi: 10.3171/jns.1991.74.2.0230

Journal of Neurosurgery 1991

82 183 Levin HS, Aldrich EF, Saydjari C, et al. Severe head injury in children: experience of the Traumatic Coma Data Bank. Neurosurgery. 1992;31(3):435-444. doi: 10.1227/00006123-199209000-00008

Neurosurgery 1992

83 183 Shankaran S, Slovis TL, Bedard MP, Poland RL. Sonographic classification of intracranial hemorrhage. A prognostic indicator of mortality, morbidity, and short-term neurologic outcome. J Pediatr. 1992;120(3):469-475. doi: 10.1016/s0022-3476(82)80462-9

Journal of Pediatrics 1982

84 182 Hadley MN, Sonntag VK, Rakate HL, Murphy A. The infant whiplash-shake injury syndrome: a clinical and pathological study. Neurosurgery. 1989;24(4):536-540. doi: 10.1227/00006123-198904000-00008

Neurosurgery 1989

85 181 Ruge JR, Simson GP, McLone DG, Cerullo LJ. Pediatric spinal injury: the very young. J Neurosurg. 1988;68(1):25-30. doi: 10.3171/jns.1988.68.1.0025

Journal of Neurosurgery 1988
Gilbert JN, Jones KL, Rorke LB, Chernoff GF, James HE. Central nervous system anomalies associated with meningomyelocele, hydrocephalus, and the Arnold-Chiari malformation: reappraisal of theories regarding the pathogenesis of posterior neural tube closure defects. Neurosurgery. 1986;18(5):559-564. doi: 10.1227/00006123-19860500-00008

Tubbs RS, Beckman J, Naffel RP, et al. Institutional experience with 500 cases of surgically treated pediatric Chiari malformation Type I. J Neurosurg Pediatr. 2011;7(3):248-256. doi: 10.3171/2010.12.PEDS10379

Berger RP, Adelson PD, Pierce MC, Dulani T, Cassidy LD, Kochanek PM. Serum neuron-specific enolase, S100B, and myelin basic protein concentrations after inflicted and noninflicted traumatic brain injury in children. J Neurosurg. 2005;103(1 Suppl):61-68. doi: 10.3171/ped.2005.103.1.0061

Karasawa J, Touho H, Ohnishi H, Miyamoto S, Kikuchi H. Long-term follow-up study after extracranial-intracranial bypass surgery for anterior circulation ischemia in childhood moyamoya disease. J Neurosurg. 1992;77(1):84-89. doi: 10.3171/jns.1992.77.1.0084

Ginsburg HH, Shetter AG, Raudzens PA. Postoperative paraplegia with preserved intraoperative somatosensory evoked potentials. Case report. J Neurosurg. 1985;63(2):296-300. doi: 10.3171/jns.1985.63.2.0296

Collins M, Lovell MR, Iverson GL, Iide T, Maroon J. Examining concussion rates and return to play in high school football players wearing newer helmet technology: a three-year prospective cohort study. Neurosurgery. 2006;58(2):275-286. doi: 10.1227/01.NEU.0000200441.92742.46

Simon TD, Riva-Cambrin J, Srivastava R, et al. Hospital care for children with hydrocephalus in the United States: utilization, charges, comorbidities, and deaths. J Neurosurg Pediatr. 2008;1(2):131-137. doi: 10.3171/PED/2008/1/2/131

Allen JC, Kim JH, Packer RJ. Neoadjuvant chemotherapy for newly diagnosed germ-cell tumors of the central nervous system. J Neurosurg. 1987;67(1):65-70. doi: 10.3171/jns.1987.67.1.0065

Thomsett MJ, Conte FA, Kaplan SL, Grumbach MM. Endocrine and neurologic outcome in childhood craniopharyngioma: review of effect of treatment in 42 patients. J Pediatr. 1980;97(5):728-735. doi: 10.1016/s0022-3476(80)80254-x

Wall BC. Hydrocephalus in Uganda: the predominance of infectious origin and primary management with endoscopic third ventriculostomy. J Neurosurg. 2005;102(1 Suppl):1-15. doi: 10.3171/ped.2005.102.1.0001

Pollack IF, Claassen D, al-Shboul Q, Janosky JE, Deutsch M. Low-grade gliomas of the cerebral hemispheres in children: an analysis of 71 cases. J Neurosurg. 1995;82(4):536-547. doi: 10.3171/jns.1995.82.4.0536

Albright AL, Guthkelch AN, Packer RJ, Price RA, Rourke LB. Prognostic factors in pediatric brain-stem gliomas. J Neurosurg. 1986;65(6):751-755. doi: 10.3171/jns.1986.65.6.0751

Kulkarni AV, Drake JM, Maffucci CL, et al. Endoscopic third ventriculostomy in the treatment of childhood hydrocephalus. J Pediatr. 2009;155(2):254-9.e1. doi: 10.1016/j.jpeds.2009.02.048

Sekhar LN, Moosy J, Guthkelch AN. Malfunctioning ventriculoperitoneal shunts. Clinical and pathological features. J Neurosurg. 1982;56(3):411-416. doi: 10.3171/jns.1982.56.3.0411

Hoffmann GF, Athanassopoulos S, Burlina AB, et al. Clinical course, early diagnosis, treatment, and prevention of disease in glutaryl-CoA dehydrogenase deficiency. Neuropediatrics. 1996;27(3):115-123. doi: 10.1055/s-2007-973761

TABLE 2: The 100 most cited papers in pediatric neurosurgery

Field of study
The categorization of journal articles was similar to that by Ponce and Lozano and Khan et al.: congenital, functional, hydrocephalus, spine, tumor, trauma, vascular, and other (Table 3) [1,12].

2021 Grayson et al. Cureus 13(12): e20694. DOI 10.7759/cureus.20694
The field of study with most publications in pediatric neurosurgery was tumor-related (n=33), followed by hydrocephalus (n=16), trauma (n=14), congenital (n=9), functional (n=6), vascular (n=5), spinal (n=4), and other (n=5). Gliomas were the most commonly discussed tumors in the pediatric population, contributing to six of the 33 total journal articles. There were four articles related to each tumor type: craniopharyngioma, medulloblastomas, and ependymomas. Other tumor-related articles were of origins such as spine and neuroepithelial. Hydrocephalus was the second most discussed topic, with findings related to shunt design, malfunctions, and improvements. Among the 14 articles describing trauma in the pediatric population, severe traumatic brain injury (n=5) and concussion (n=4) were the most common topics. The reviewed articles from the vascular field were related to abnormal cerebral blood flow, intraventricular hemorrhage, and revascularization. Topics that did not fit the listed categories were listed as "Other" and included articles related to magnetic resonance imaging (MRI) findings for non-traumatic brain injury, craniectomy, and neurological problems associated with preterm infants.

**Type of study**

The articles were also categorized by time of study, based on the information from the article or the category assigned by PubMed (Table 3). The 100 selected journal articles comprised 34 original articles, 33 reviews, 12 clinical trials, 11 comparative studies, and 8 case report/reviews; there was also one cross-sectional and one multi-center study. Over two-thirds of the most cited pediatric neurosurgical articles were either original (prospective, non-review) or review (retrospective with regard to data collection and analysis). Clinical trials were most common in articles related to tumors (n=7), hydrocephalus (n=2), trauma (n=2), and vascular (n=1). Although hydrocephalus and trauma were the second and third most commonly studied fields, they each had four comparative studies, the rest of the comparative studies being congenital (n=1), trauma (n=1), and vascular (n=1). Case reports were most common in the vascular field (n=3), followed by tumor-related (n=2), trauma (n=1), functional (n=1), and congenital (n=1). Both the cross-sectional and multi-center studies were related to hydrocephalus.

**Discussion**

In this literature review, we present the top 100 most cited articles in pediatric neurosurgery since 1976. Our research was conducted similarly to other reviews of the most relevant articles within their respective fields [1,4-9]. To keep this article focused solely on clinical neurosurgery in the pediatric population, we excluded basic science research, animal studies, and any articles that included an adult population. This article contributes significantly to neurosurgery, as pediatric neurosurgery is a specific and more recent subspecialty that requires its own analysis. Although Ponce and Lozano [1,4] published two articles on the most cited work in neurosurgery, only three of their 100 are consistent with pediatric neurosurgical findings, regarding neuroepithelial tumors and the positive effects of surgical resection [13], randomized trial for treatment of medulloblastoma [14], and findings concerning shaken baby syndrome [15]. Furthermore, in 2013, Wilcox et al. compiled and categorized the most cited work in pediatric neurosurgery; however, they only evaluated four clinical pediatric neurological journals and included basic science research within the criteria for relevance [16]. This work was continued by Khan et al. in 2015, in Part 2, with a focus on non-pediatric journals only, excluding basic science, imaging, histology, pathology and pharmacology-related articles from their selection of the top 100 [12].

Overall, the present study contributes to the field of pediatric neurosurgery by compiling pediatric neurosurgical articles in a single review, with a specific focus on pediatric clinical neurological studies from pediatric and non-pediatric surgical journals and non-surgical journals. Furthermore, by grouping the 100
most cited pediatric neurosurgical articles in the field within one table, we hope to eliminate the time burden for other physicians, residents, and others interested in learning about the pediatric neurosurgery field.

Limitations
Several limitations are associated with the citation analysis and the impact of journal articles. There is still a debate about correlating the number of citations with the importance of an article [3]. The journals selected do not encompass all those in which highly cited articles in pediatric neurosurgery can be published, so seminal articles could have been missed. Owing to the time frame of the literature search, more recent articles that could have a high impact might not yet have had time to accumulate the citations necessary to be included in the rankings [17]. The limitations of the Web of Science database must also be considered as it only includes citation data from 1976 to 2021, so older journal articles, or very new ones, will not necessarily be well represented. Other databases such as Google Scholar (2,689,809) or Microsoft Academic (1,840,702) also contain more citations than the Web of Science Core Collection (1,503,657) [2].

Conclusions
Using the Web of Science Core Collection database, the top 100 articles in pediatric neurosurgery from the selected journals were identified and citation analysis was used to identify the most impactful articles. The compilation could help clinicians and researchers to familiarize themselves with the journal articles included in terms of study type, study field, journal of publication, and recurring authors. Although there might not be a direct impact of such an article on clinical practice, a review of this nature is of archival value and shows pediatric neurosurgeons in the field what papers are of most value to others who have cited their works.

Additional Information
Disclosures
Conflicts of interest: In compliance with the ICMJE uniform disclosure form, all authors declare the following: Payment/services info: All authors have declared that no financial support was received from any organization for the submitted work. Financial relationships: All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. Other relationships: All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

References
1. Ponce FA, Lozano AM: Highly cited works in neurosurgery. Part I: the 100 top-cited papers in neurosurgical journals. J Neurosurg. 2010, 112:223-32. 10.3171/2009.12.JNS091599
2. Martin-Martín A, Thelwall M, Orduna-Malea E, Delgado López-Cózar E: Google Scholar, Microsoft Academic, Scopus, Dimensions, Web of Science, and OpenCitations’ COCI: a multidisciplinary comparison of coverage via citations. Scientometrics. 2021, 126:871-906. 10.1007/s11192-020-03690-4
3. Moed HF: New developments in the use of citation analysis in research evaluation. Arch Immunol Ther Exp (Warsz). 2009, 57:13. 10.1007/s00005-009-0001-5
4. Ponce FA, Lozano AM: Highly cited works in neurosurgery. Part II: the citation classics. J Neurosurg. 2010, 112:233-46. 10.3171/2009.12.JNS091600
5. Loonen MP, Hage JJ, Kon M: Plastic surgery classics: characteristics of 50 top-cited articles in four plastic surgery journals since 1946. Plast Reconstr Surg. 2008, 121:520e-7e. 10.1097/PRS.0b013e3181815369
6. Stern RS, Arndt KA: Classic and near-classic articles in the dermatologic literature. Arch Dermatol. 1999, 135:948-50. 10.1001/archderm.135.8.948
7. Lefaivre KA, Shadgan B, O’Brien PJ: 100 most cited articles in orthopaedic surgery. Clin Orthop Relat Res. 2011, 469:1487-97. 10.1007/s11999-010-1604-1
8. Ohba N, Nakao K, Inashiki Y, Ohba A: The 100 most frequently cited articles in ophthalmology journals. Arch Ophthalmol. 2007, 125:952-60. 10.1001/archopht.125.7.952
9. Brandt JS, Hadaya O, Schuster M, Rosen T, Sauer MV, Ananth CV: A bibliometric analysis of top-cited journal articles in obstetrics and gynecology. JAMA Netw Open. 2019, 2:e1918007. 10.1001/jamanetworkopen.2019.18007
10. Grant GA, Jolley M, Ellenbogen RG, Roberts TS, Gruss JR, Loeser JD: Failure of autologous bone-assisted cranioplasty following decompressive craniectomy in children and adolescents. J Neurosurg. 2004, 100:163-8. 10.3171/jns.2004.100.2.0163
11. Tubbs RS, McGirt MJ, Oakes WJ: Surgical experience in 130 pediatric patients with Chiari I malformations. J Neurosurg. 2003, 99:291-6. 10.3171/jns.2003.99.2.0291
12. Khan NR, Autschwitz T, McBee H, Roop FA, Klimo P Jr: Highly cited publications in pediatric neurosurgery: part 2. Childs Nerv Syst. 2015, 29:2215-28. 10.1007/s00381-015-2295-3
13. Daumas-Dupont C, Scheithauer BW, Chodkiewicz JP, Laws ER Jr, Vedernikova C: Dysmyeloplastic neuroepithelial tumor: a surgically curable tumor of young patients with intractable partial seizures. Report of thirty-nine cases. Neurosurgery. 1988, 23:345-56. 10.1227/00006123-19881100-00002
14. Evans AE, Jenkin RD, Sporzo R, et al.: The treatment of medulloblastoma. Results of a prospective randomized trial of radiation therapy with and without CCNU, vincristine, and prednisone. J Neurosurg. 1990, 72:572-82. 10.3171/jns.1990.72.4.0572
15. Duhaime AC, Gennarelli TA, Thibault LE, Bruce DA, Margulies SS, Wiser R: The shaken baby syndrome. A clinical, pathological, and biomechanical study. J Neurosurg. 1987, 66:409-15. 10.3171/jns.1987.66.3.0409

16. Wilcox MA, Khan NR, McAbee JH, Boop FA, Klimo P Jr: Highly cited publications in pediatric neurosurgery. Childs Nerv Syst. 2013, 29:2201-13. 10.1007/s00381-013-2228-z

17. Gisvold SE: Citation analysis and journal impact factors - is the tail wagging the dog?. Acta Anaesthesiol Scand. 1999, 43:971-5. 10.1034/j.1399-6576.1999.431001.x