

CURRICULUM VITAE

Petra Margarete Klinge, M.D. Ph.D.

PERSONAL INFO

Current Position Professor of Neurosurgery
Alpert Medical School Brown University
Attending Neurosurgeon
Director, Pediatric Neurosurgery Division
Director, Research Center and Clinic for Cerebrospinal Fluid Disorders
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EDUCATION

1986 -1988 Medical School Bochum, Germany
1988 - 1993 Medical School Kiel, Germany
1993 M.D. degree, Medical School Kiel
2002 Ph.D. degree Hannover Medical School, Germany

POSTGRADUATE HONOURS AND AWARDS

2001 Best Poster Award at the 27th scientific annual meeting of the German Federation of women in medicine

09/2009 Top Abstract Award : Interventricular implantation of alginate-encapsulated glucagon/like-peptide-1 (GLP-1) producing human mesenchymal stem cells in a double transgenic mouse model of AD. 2nd Annual meeting of the International Society of Hydrocephalus and CSF disorders

02/2014 Brite-Lite Winner 2013, Hasbro Children's Hospital, RI
http://www.hasbrochildrenshospital.org/About/Brite_Lite_Program.html

06/2014 Recognition for Exemplary Teaching in BIOL 3652 IMS II:Brain Sciences
Brown University

PROFESSIONAL LICENSES AND BOARD CERTIFICATION

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| 1994 | German Medical License |
| 2002 | German Board Certification and Accreditation as Specialist for Neurosurgery |
| 2008 | Rhode Island ACADEMIC Medical License (LA 00007, LA 00013 since 7/2014) |
| 2018 | Rhode Island Full Medical License (MD 16805) |

ACADEMIC APPOINTMENTS

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|----------------|--|
| 2002 - 2008 | Assistant Professor of Neurosurgery Medical School Hannover Germany |
| 2002 - present | Associate Professor of Neurosurgery Medical School Hannover Germany |
| 2009 - 2016 | Associate Professor of Neurosurgery Warren Alpert Medical School, Brown University |
| 2016 - present | Professor of Neurosurgery, Warren Alpert Medical School Brown University |
| 2011 | Honorary Degree of Master of Arts ad eundum, Brown University |
| 2013 | Visiting Professor, Thomas Jefferson University Philadelphia, Department of Neurological Surgery |

HOSPITAL APPOINTMENTS

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|----------------|--|
| 1993 – 1994 | Department of Neurosurgery Westküstenhospital, Heide-Holstein, Germany (Residency) |
| 1995 – 2002 | Department of Neurosurgery Medical School Hannover, Germany (Residency) |
| 2002 – 2004 | Department of Neurosurgery International Neuroscience Institute Hannover (Fellowship) |
| 2004 –2009 | Senior Physician, Department of Neurosurgery International Neuroscience Institute Hannover |
| 2009 - present | Attending Neurosurgeon, Rhode Island Hospital, Providence, RI Additional hospital privileges: Miriam Hospital, Providence, Butler Hospital, Providence, Women & Infants Hospital Providence |
| 2016 – present | Director of the Center for Cerebrospinal fluid disorders of the brain and spine, Rhode Island Hospital and Warren Alpert Medical School at Brown University |
| 2017 - present | Director of the Division of Pediatric Neurosurgery, Rhode Island Hospital and Hasbro Children’s Hospital |

OTHER APPOINTMENTS

EDITORIAL BOARD

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| 2013 – present | Editor in Chief Elsevier Journal “Interdisciplinary Neurosurgery: Advanced Techniques and Case Management” |
| 2009 – present | Co-Editor Elsevier Journal “Clinical Neurology and Neurosurgery |

2011 – present since 7/2014 Editorial board member of “Journal of Fluid Barriers in the CNS ” Associate Editor “Neurosurgery” – Neuroscience Section

REVIEWER

2003- present Ad hoc reviewer of peer-reviewed journals: Neurosurgery, Journal of Neurosurgery, Acta Neurochirurgica, Journal of Neurology&Neurosurgery&Psychiatry, Journal of Cerebral Blood flow and Metabolism, Brain, Journal of Magnetic Resonance Imaging, European Journal of Neurology, Acta Neurological Scandinavica , Experimental Neurology, Neuroscience Letters, Journal of Fluids and Barriers of the CNS, Nature Clinical Practice ,Journal of Alzheimer’s disease, International Journal of Alzheimers disease, Journal of Neurogenetics, Journal of Neurosurgical Sciences, Neurosurgical Reviews, American Journal of Alzheimer’s Disease and other Dementias, Journal of Microencapsulation, BMC Neurology, Neurology, Child Neurology, World Neurosurgery.

SOCIETY & CONGRESS PRESIDENCY, PI STUDY GROUPS, PI CLINICAL TRIAL, ADVISORY BOARD MEMBERSHIP, CONGRESS FACULTY and NATIONAL SCIENTIFIC APPOINTMENTS

2000 – 2005 Co-Chair, International NPH-Advisory Board for evaluation of guidelines for the diagnosis and therapy of normal pressure hydrocephalus

2004-2009 Leading Principal Investigator of the “European Multicenter Study on Normal Pressure Hydrocephalus”, Clinicaltrials.org Identifier: NCT00874198

2008 President of “Hydrocephalus 2008”, Inauguration congress of the International society of Hydrocephalus and CSF disorders

2010 – 2012 President, International Society of Hydrocephalus and CSF Disorders. (www.ISHCSF.com)

2010 - 2018 Faculty speaker and Panelist at the AANS Breakfast seminar “Contemporary Management for Adult Hydrocephalus”.

2012- 2015 Principle Investigator in the multicenter “Efficacy of shunt surgery in normal pressure hydrocephalus: a randomized crossover study”, Participating centers: Johns Hopkins University, Rhode Island Hospital

2012 - 2020 Co-Investigator of a prospective clinical trial "Development of normative standards for diagnosing coordination and gait problems in Normal Pressure Hydrocephalus" (IRB#1105-001), Department of Psychiatry and Human Behaviour, Butler Hospital, RI

2014 - present

- 2014 - present Member of the NINDS Common Data Element (CDE) Project Chiari Malformation (CM) Working Group (Chiari & Syringomyelia Foundation)
- Member of the Scientific, Education & Advisory Board of the Chiari & Syringomyelia Foundation and Scientific Presenter at the Annual Colloquium and THINK TANK Meetings (<http://csfinfo.org/about-us/scientific-education-advisory-board/>)
- October 2015 Chair and Program Director of the **1st Aesculap Symposium in the Treatment and Management of Hydrocephalus**. Chicago, IL, October 9th to 10th, 2015
- 2015 - present Member of the Neurology working group to identify Standard and Guidelines in the management of Ehlers-Danlos-Disease (<http://eds2016.org/neurology-working-group/>)
- 2016 Program director of the CME accredited “1st Annual CSF symposium” at the Warren Alpert Medical School of Brown University and Rhode Island Hospital (<https://www.brown.edu/academics/medical/education/other-programs/continuing-medical-education/live-conferences/1st-annual-cerebrospinal-fluid-disorders-symposium>)
- 2017 Program director of the CME accredited “2nd Annual CSF Symposium” at the Warren Alpert Medical School of Brown university & Rhode Island Hospital
- 2018 Program director of the CME accredited “3rd Annual CSF Symposium” at the Warren Alpert Medical School of Brown University & Rhode Island Hospital.
- 2019 Program director of the CME accredited “4th Annual CSF Symposium” at the Warren Alpert Medical School of Brown University & Rhode Island Hospital.
- 2020 – present Member of the NINDS Common Data Element (CDE) Project “ Occult tethered cord syndrome” Working Group (Chiari & Syringomyelia Foundation)
- 2017 to present Chair of the oversight committee of “ Placebo-controlled Effectiveness in INPH Shunting (PENS) Trial: Proof of Concept “ _ (Principal investigator: Mark Luciano, Johns Hopkins Neurosurgical Department)
- Since 2021 Elected member of the “ Committee on Selected Heritable Connective Tissue Disorders and Disability Packet” _ National Academy of Sciences*Engineering*Medicine _ nationalacademies.org/HMD

RHODE ISLAND HOSPITAL COMMITTEES

- 2010 – present Member of the Surgical Clinical Practice Committee RIH

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| 2011 – present | Liaison and member of the pediatric trauma committee |
| 2010 – present | Co-presenter interdisciplinary pediatric tumor board |
| 2016 | Member of the search committee for PICU academic co-director position |
| 2017-2018 | Member of the search committee for Academic pediatric surgery faculty |
| 2018 to present | Member of the Neurology and Neurosurgery Promotion committee at RIH and HASBRO |
| Since 2021 | Member of the search committee for PICU medical director |

BROWN UNIVERSITY COMMITTEES

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| 2012 – present | Physician Mentor in the Medicine in Action Program (MIAP), Brown medical students and PLME undergraduate students shadowing Brown clinical faculty. |
| 2010- present 2012 | Faculty member of the Fetal Medicine @ Brown. BIOL 5720 Member of the Brown University Fetal Medicine Program visiting faculty at The Fetal Center at Vanderbilt University, Nashville Tennessee |

MEMBERSHIP IN SOCIETIES

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| 2013 – present | Congress of Neurological surgeons (CNS) |
| 2013 – present | American Association of Neurological Surgeons (AANS) |
| 2004 - present | Society for Research into Intractable Hydrocephalus and Spina Bifida |
| 2008 – present | International Society Hydrocephalus and Cerebrospinal fluid disorders 2008-10 Founding Member and President Elect, 2010-12 President, 2012-14 Chair of the Nomination Committee |
| 2011- present | International Hydrocephalus Imaging Working Group (www.IHIWG.org) |
| 2017 – present | International Fellow of the AANS (IFAANS) |
| 2016 – present | International Ehlers – Danlos – Society |
| 2018 - present | New England Neurosurgical Society |

PUBLICATIONS ORIGINAL PUBLICATIONS:

1. Klinge, P., D. Schmidt, and D. Harms. Fibromatosen im Kindesalter. Verh DtschGes Pathol, 1990. **74**: p. 670.
2. Schmidt, D., et al., Infantile desmoid-type fibromatosis. Morphological features correlate with biological behaviour. J Pathol, 1991. **164**(4): p. 315-9.
3. Brinker, T., et al., Sinusoidal intrathecal infusion for assessment of CSF dynamics in kaolin-induced hydrocephalus. Acta Neurochir (Wien), 1998. **140**(10): p. 1069-75.
4. Klinge, P., et al., PET and CBF studies of chronic hydrocephalus: a contribution to surgical indication and prognosis. J Neuroimaging, 1998. **8**(4): p. 205-9.
5. Klinge, P., et al., Cerebral blood flow in chronic hydrocephalus - a parameter indicating shunt failure- new aspects. Acta Neurochir (Wien), 1998. **Suppl 71**: p. 347-349.
6. Klinge, P., et al., Hirndurchblutungsmuster bei Patientenmit chronisch hydrocephaler Symptomatik vor und nach Shuntanlage. Geriat Forsch, 1998. **8**: p. 7-15.

7. Schatzmann, C., et al., Treatment of elevated intracranial pressure by infusions of 10% saline in severely head injured patients. *Acta Neurochir Suppl*, 1998. **71**: p. 31-33.
8. Klinge, P., et al., Superselektive Angiographie der Arteria occipitalis bei pulssynchronem Tinnitus. *Klinische Neuroradiologie*, 1999: p. 45-49.
9. Klinge, P.M., et al., Induction of heat shock protein 70 in the rat brain following intracisternal infusion of autologous blood: evaluation of acute neuronal damage. *J Neurosurg*, 1999. **91**(5): p. 843-50.
10. Klinge, P.M., et al., A positron emission tomography study of cerebrovascular reserve before and after shunt surgery in patients with idiopathic chronic hydrocephalus. *J Neurosurg*, 1999. **91**(4): p. 605-9.
11. Klinge, P.M., et al., Regeneration of a transected peripheral nerve by transplantation of spinal cord encapsulated in a vein. *Neuroreport*, 2001. **12**(6): p. 1271-5.
12. Klinge, P.M., et al., Immunohistochemical characterization of axonal sprouting and reactive tissue changes after long-term implantation of a polyimide sieve electrode to the transected adult rat sciatic nerve. *Biomaterials*, 2001. **22**(17): p. 2333-43.
13. Klinge, P., et al., PET-studies in idiopathic chronic hydrocephalus before and after shunt-treatment: the role of risk factors for cerebrovascular disease (CVD) on cerebral hemodynamics. *Acta Neurochir Suppl*, 2002. **81**: p. 43-5.
14. Klinge, P., et al., The role of cerebral blood flow and cerebrovascular reserve capacity in the diagnosis of chronic hydrocephalus--a PET-study on 60 patients. *Acta Neurochir Suppl*, 2002. **81**: p. 39-41.
15. Klinge, P., et al., Regional cerebral blood flow profiles of shunt-responder in idiopathic chronic hydrocephalus--a 15-O-water PET-study. *Acta Neurochir Suppl*, 2002. **81**: p. 47-9.
16. Klinge, P., et al., Temporal and regional profile of neuronal and glial cellular injury after induction of kaolin hydrocephalus. *Acta Neurochir Suppl*, 2002. **81**: p. 275-7.
17. Klinge, P., et al., Neuropsychological sequels to changes in global cerebral blood flow and cerebrovascular reserve capacity after shunt treatment in chronic hydrocephalus--a quantitative PET-study. *Acta Neurochir Suppl*, 2002. **81**: p. 55-7.
18. Klinge, P., et al., Neuropsychological testing to improve surgical management of patients with chronic hydrocephalus after shunt treatment. *Acta Neurochir Suppl*, 2002. **81**: p. 51-3.
19. Luedemann, W., et al., Spinal cerebrospinal fluid pathways and their significance for the compensation of kaolin-hydrocephalus. *Acta Neurochir Suppl*, 2002. **81**: p. 271-3.
20. Schuhmann, M.U., et al., Dynamic shunt testing applying short lasting pressure waves--inertia of shunt systems. *Acta Neurochir Suppl*, 2002. **81**: p. 19-21.
21. Klinge, P.M., et al., Cerebral hypoperfusion and delayed hippocampal response after induction of adult kaolin hydrocephalus. *Stroke*, 2003. **34**(1): p. 193-9.
22. Schuhmann, M.U., et al., Temporal profiles of cerebrospinal fluid leukotrienes, brain edema and inflammatory response following experimental brain injury. *Neurol Res*, 2003. **25**(5): p. 481-91.
23. Schuhmann, M.U., et al., Metabolic changes in the vicinity of brain contusions: a proton magnetic resonance spectroscopy and histology study. *J Neurotrauma*, 2003. **20**(8): p. 725-43.

24. Kaminsky, J., et al., Specially adapted interactive tools for an improved 3D-segmentation of the spine. *Comput Med Imaging Graph*, 2004. **28**(3): p. 119-27.
25. Bergsneider, M., et al., Surgical management of idiopathic normal-pressure hydrocephalus, in *Neurosurgery*. 2005. p. S29-39; discussion ii-v.
26. Klinge, P., et al., Outcome of shunting in idiopathic normal-pressure hydrocephalus and the value of outcome assessment in shunted patients. *Neurosurgery*, 2005. **57**(3 Suppl): p. S40-52; discussion ii-v.
27. Marmarou, A., et al., The value of supplemental prognostic tests for the preoperative assessment of idiopathic normal-pressure hydrocephalus, in *Neurosurgery*. 2005. p. S17-28; discussion ii-v.
28. Marmarou, A., et al., Development of guidelines for idiopathic normal-pressure hydrocephalus: introduction, in *Neurosurgery*. 2005. p. S1-3; discussion ii-v.
29. Marmarou, A., et al., Guidelines for management of idiopathic normal pressure hydrocephalus: progress to date, in *Acta Neurochir Suppl*. 2005. p. 237-40.
30. Relkin, N., et al., Diagnosing idiopathic normal-pressure hydrocephalus, in *Neurosurgery*. 2005. p. S4-16; discussion ii-v.
31. Gielow, P., et al., Synthesis and preliminary biological evaluation of [¹²³I]Me2Pyr, a new potential ligand for imaging of central cannabinoid CB1 receptors. *Appl Radiat Isot*, 2006. **64**(7): p. 763-8.
32. Klinge, P.M., et al., Brain amyloid accumulates in aged rats with kaolin-induced hydrocephalus. *Neuroreport*, 2006. **17**(6): p. 657-60.
33. Johanson, C.E., et al., Multiplicity of cerebrospinal fluid functions: New challenges in health and disease. *Cerebrospinal Fluid Res*, 2008. **5**: p. 10.
34. Jones, H.C. and P.M. Klinge. Hydrocephalus 2008, 17-20th September, Hannover Germany: a conference report. in *Cerebrospinal Fluid Res*. 2008.
35. Klinge, P.M., et al., Correlates of local cerebral blood flow (CBF) in normal pressure hydrocephalus patients before and after shunting--A retrospective analysis of [(15)O]H(2)O PET-CBF studies in 65 patients. *Clin Neurol Neurosurg*, 2008. **110**(4): p. 369-75.
36. Mirzayan, M.J., et al., Modified calcium accumulation after controlled cortical impact under cyclosporin A treatment: a ⁴⁵Ca autoradiographic study. *Neurol Res*, 2008. **30**(5): p. 476-9.
37. Deren, K.E., et al., Low levels of amyloid-beta and its transporters in neonatal rats with and without hydrocephalus. *Cerebrospinal Fluid Res*, 2009. **6**: p. 4.
38. Gerganov, V.M., et al., Prognostic clinical and radiological parameters for immediate facial nerve function following vestibular schwannoma surgery. *Acta Neurochir (Wien)*, 2009. **151**(6): p. 581-7; discussion 587.
39. Heile, A.M., et al., Cerebral transplantation of encapsulated mesenchymal stem cells improves cellular pathology after experimental traumatic brain injury. *Neurosci Lett*, 2009. **463**(3): p. 176-81.
40. Silverberg, G.D., et al., Amyloid and Tau accumulate in the brains of aged hydrocephalic rats. *Brain Res*, 2010. **1317**: p. 286-96.

41. Glage, S., et al., Therapeutic concentrations of glucagon-like peptide-1 in cerebrospinal fluid following cell-based delivery into the cerebral ventricles of cats. *Fluids Barriers CNS*, 2011. **8**: p. 18.
42. Kleinschmidt, K., et al., Alginate encapsulated human mesenchymal stem cells suppress syngeneic glioma growth in the immunocompetent rat. *J Microencapsul*, 2011. **28**(7): p. 621-7.
43. Klinge, P.M., et al., Encapsulated native and glucagon-like peptide-1 transfected human mesenchymal stem cells in a transgenic mouse model of Alzheimer's disease. *Neurosci Lett*, 2011. **497**(1): p. 6-10.
44. Hellstrom, P., et al., A new scale for assessment of severity and outcome in iNPH. *Acta Neurol Scand*, 2012. **126**(4): p. 229-37.
45. Hellstrom, P., et al., The neuropsychology of iNPH: findings and evaluation of tests in the European multicentre study. *Clin Neurol Neurosurg*, 2012. **114**(2): p. 130-4.
46. Karian, L.S., et al., Technology to minimize the morbidity of Le Fort III osteotomies. *Plast Reconstr Surg*, 2012. **130**(1): p. 210e-212e.
47. Klinge, P., et al., One-year outcome in the European multicentre study on iNPH. *Acta Neurol Scand*, 2012. **126**(3): p. 145-53.
48. Klinge, P.M., Idiopathic normal pressure hydrocephalus--neurosurgical management of dementia! *Med Health R I*, 2012. **95**(3): p. 86-7.
49. Mirzayan, M.J., et al., MRI safety of a programmable shunt assistant at 3 and 7 Tesla. *Br J Neurosurg*, 2012. **26**(3): p. 397-400.
50. ReKate, H.L., et al., Fifth International Hydrocephalus Workshop, Crete, Greece, May 20-23, 2010: themes and highlights, in *Acta Neurochir Suppl*. 2012. p. 1-7.
51. Phillips, B.Z., et al., Piezoelectric Technology for Pediatric Autologous Cranioplasty. *Cleft Palate Craniofac J*, 2013.
52. Wikkelsø, C., et al., The European iNPH Multicentre Study on the predictive values of resistance to CSF outflow and the CSF Tap Test in patients with idiopathic normal pressure hydrocephalus. *J Neurol Neurosurg Psychiatry*, 2013. **84**(5): p. 562-8.
53. Cossman, J.P., et al., Traumatic orbital roof fractures: interdisciplinary evaluation and management. *Plast Reconstr Surg*, 2014. **133**(3): p. 335e-43e.
54. Brinker T, Stopa E, Morrison J, Klinge P. A new look at cerebrospinal fluid circulation. *Fluids Barriers CNS*. 2014 May 1;11:10. doi: 10.1186/2045-8118-11-10. eCollection 2014. Review.
55. Tracy A, Klinge P, Morrison J, Jayaraman MV, Kriz PK. Traumatic Superficial Temporal Artery Pseudoaneurysm in a Helmeted Lacrosse Player. *Curr Sports Med Rep*. 2016 Jan-Feb;15(1):13-5. doi: 10.1249/JSR.0000000000000218.
56. Rossetti, M.A., et al., Two Novel Psychomotor Tasks in Idiopathic Normal Pressure Hydrocephalus. *J Int Neuropsychol Soc*, 2016. **22**(3): p. 341-9.
57. Carnevale JA, Morrison JF, Choi DB, Klinge PM, Cosgrove GR, Oyelese AA. Self-inflicted nail-gun injury with cranial penetration and use of intraoperative computed tomography. *Surg Neurol Int*. 2016 May 6;7(Suppl 10):S259-62. doi: 10.4103/2152-7806.181980. eCollection 2016.

58. Iyengar RJ, Klinge PM, Chen WS, Boxerman JL, Sullivan SR, Taylor HO. Management of Craniostyosis at an Advanced Age: Controversies, Clinical Findings, and Surgical Treatment. *J Craniofac Surg*. 2016 Jul;27(5):e435-41.
59. Daou B, Klinge P, Tjoumakaris S, Rosenwasser RH, Jabbour P. Revisiting secondary normal pressure hydrocephalus: does it exist? A review. *Neurosurg Focus*. 2016 Sep;41(3): E6.
60. Ha AY, Mangham W, Frommer SA, Choi D, Klinge P, Taylor HO, Oyelese AA, Sullivan SR. Interdisciplinary Management of Minimally Displaced Orbital Roof Fractures: Delayed Pulsatile Exophthalmos and Orbital Encephalocele. *Craniofac Trauma Reconstr*. 2017 Mar;10(1):11-15. doi: 10.1055/s-0036-1584395.
61. Henderson FC Sr, Austin C, Benzel E, Bolognese P, Ellenbogen R, Francomano CA, Ireton C, Klinge P, Koby M, Long D, Patel S, Singman EL, Voermans NC. Neurological and spinal manifestations of the Ehlers-Danlos syndromes. *Am J Med Genet C Semin Med Genet*. 2017 Mar;175(1):195-211.
62. Doberstein CA, Torabi R, Klinge PM. Current Concepts in the Pathogenesis, Diagnosis, and Management of Type I Chiari Malformations. *R I Med J (2013)*. 2017 Jun 1;100(6):47-49. Review.
63. Klinge, P.M., et al., Abstracts from Hydrocephalus 2016. *Fluids Barriers CNS*. 2017 Jun 7;14(Suppl 1):15.
64. Linden OE, Baratta VM, Gonzalez JA, Byrne ME, Klinge PM, Sullivan SR, Taylor HO. Surgical Correction of Metopic Craniostyosis: A 3-D Photogrammetric Analysis of Cranial Vault Outcomes. *Cleft Palate Craniofac J*. 2019 Feb;56(2):231-235.
65. Feletti A, d'Avella D, Wikkelsø C, Klinge P, Hellström P; European iNPH Multicenter Study Group. Ventriculoperitoneal Shunt Complications in the European Idiopathic Normal Pressure Hydrocephalus Multicenter Study. *Oper Neurosurg (Hagerstown)*. 2019 Jul 1;17(1):97-102.
66. Gargano F, Welch JJ, Klinge PM, Sullivan SR, Taylor HO. Langerhans Cell Histiocytosis in the Pediatric Population: Treatment of Isolated Craniofacial Lesions. *J Craniofac Surg*. 2019 Jun;30(4):1191-1193.
67. Snegovskikh D, Svokos K, Souza D, Renaud E, Klinge PM, Carr SR, Luks FI. An Open Fetal Myelomeningocele Repair with Incorporation of a Skin Allograft. *J Obstet Gynaecol Can*. 2019 Jul 6.
68. McElroy A, Rashmir A, Manfredi J, Sledge D, Carr E, Stopa E, Klinge P. Evaluation of the Structure of Myodural Bridges in an Equine Model of Ehlers-Danlos Syndromes. *Sci Rep*. 2019 Jul 10;9(1):9978.
69. Bounds, HA, Poeta, DL, Klinge, PM, and Burwell, RD. Paw-Print Analysis of Contrast-Enhanced Recordings (PrAnCER): A low-cost, open-access automated gait analysis system for assessing motor deficits. Accepted and currently in production in *JOVE Journal of Visualized Experiments*.
70. Niermeyer M, Gaudet C, Malloy P, Piryatinsky I, Salloway S, Klinge P, Lee A. Frontal Behavior Syndromes in Idiopathic Normal Pressure Hydrocephalus as a Function of Alzheimer's Disease Biomarker Status. *J Int Neuropsychol Soc*. 2020 Oct;26(9):883-893. doi: 10.1017/S1355617720000387. Epub 2020 May 20. PMID: 32430087; PMCID: PMC7554119.

71. Snegovskikh D, Svokos K, Souza D, Renaud E, Klinge PM, Carr SR, Luks FI. An Open Fetal Myelomeningocele Repair With Incorporation of a Skin Allograft. *J Obstet Gynaecol Can.* 2020 Feb;42(2):177-178. doi: 10.1016/j.jogc.2019.04.015. Epub 2019 Jul 6. PMID: 31289012.
- 72: Feletti A, d'Avella D, Wikkelsø C, Klinge P, Hellström P, Tans J, Kiefer M, Meier U, Lemcke J, Paternò V, Stieglitz L, Sames M, Saur K, Kordás M, Vitanovic D, Gabarrós A, Llarga F, Triffaux M, Tyberghien A, Juhler M, Hasselbalch S, Cesarini K, Laurell K. Ventriculoperitoneal Shunt Complications in the European Idiopathic Normal Pressure Hydrocephalus Multicenter Study. *Oper Neurosurg (Hagerstown).* 2019 Jul 1;17(1):97-102. doi: 10.1093/ons/opy232. PMID: 30169650.
- 73: Bounds HA, Poeta DL, Klinge PM, Burwell RD. Paw-Print Analysis of Contrast-Enhanced Recordings (PrAnCER): A Low-Cost, Open-Access Automated Gait Analysis System for Assessing Motor Deficits. *J Vis Exp.* 2019 Aug 12;(150):10.3791/59596. doi: 10.3791/59596. PMID: 31449248; PMCID: PMC6827337.
- 74: Beland MD, McElroy AW, Brinker T, Gokaslan ZL, Klinge PM. In Vivo Ultrasound Imaging of the Spinal Cord and Subarachnoid Space at the C1-C2 Level in Healthy Adult Subjects. *Ultrasound Q.* 2020 Dec 8. doi: 10.1097/RUQ.0000000000000542. Epub ahead of print. PMID: 33298792.
- 75: Daou B, Klinge P, Tjoumakaris S, Rosenwasser RH, Jabbour P. Revisiting secondary normal pressure hydrocephalus: does it exist? A review. *Neurosurg Focus.* 2016 Sep;41(3):E6. doi: 10.3171/2016.6.FOCUS16189. PMID: 27581318.
- 76: Durand WM, Anderson M, Baker A, Daniels AH, Rogg JM, Klinge PM. Meningocele Manqué Discovered During Filum Terminale Resection in Occult Tethered Cord Syndrome. *World Neurosurg.* 2019 Dec;132:148-153. doi: 10.1016/j.wneu.2019.08.016. Epub 2019 Aug 17. PMID: 31430540.
- 77: Madsen JR, Boyle TP, Neuman MI, Park EH, Tamber MS, Hickey RW, Heuer GG, Zorc JJ, Leonard JR, Leonard JC, Keating R, Chamberlain JM, Frim DM, Zakrzewski P, Klinge P, Merck LH, Piatt J, Bennett JE, Sandberg DI, Boop FA, Hameed MQ. Diagnostic Accuracy of Non-Invasive Thermal Evaluation of Ventriculoperitoneal Shunt Flow in Shunt Malfunction: A Prospective, Multi-Site, Operator-Blinded Study. *Neurosurgery.* 2020 Oct 15;87(5):939-948. doi: 10.1093/neuros/nyaa128. PMID: 32459841; PMCID: PMC7566379.
- 78: Poggi J, Chen WS, Taylor HO, Sullivan S, Woo AS, Klinge PM. Revisiting the Resolution of Chiari Malformation in Nonsyndromic Craniosynostosis: A Case of Posterior Cranial Vault Reconstruction in Secondary Pan-Suture Synostosis. *World Neurosurg.* 2020 Nov;143:158-162. doi: 10.1016/j.wneu.2020.07.138. Epub 2020 Jul 27. PMID: 32730962.

CASE REPORTS

1. Swenson DW, Nickel BJ, Boxerman JL, Klinge PM, Rogg JM: **Prenatal MRI characterization of brainstem glioma.** Pediatric Radiology 2013, 43:1404-1407.
2. Taylor EM, Klinge PM, Sullivan SR, Taylor HO: **Cerebrospinal fluid leak masquerading as a decubitus ulcer in a patient with spina bifida.**Eplasty. 2013, 11:13
3. Fehnel CR, Wendell LC, Potter NS, Klinge P, Thompson BB: **Severe cerebral vasospasm after traumatic brain injury.** R I Med J (2013). 2014 Jul 1;97(7):45-6.
4. Carnevale JA, Ahmedli N, Morrison JF, Asaad WF, Klinge P, Telfeian A. **T-Connector Modification for Reducing Recurrent Distal Shunt Failure: Report of 2 Cases.** Oper Neurosurg (Hagerstown). 2017 Dec 1;13(6):E33-E36.

BOOK CHAPTERS

- 1 Klinge, P.; Heissler, H. E.; Rickels, E.; König, K.; Fischer, J.; Burchert, W.; Zumkeller, M. **Cerebral blood flow (CBF) in chronic hydrocephalus: new aspects.** In: New trends in cerebral Hemodynamics and Neurosonology. J. Klingelhöfer; E. Barthels; E. B. Ringelstein (eds.). Elsevier Science B.v.; Amsterdam – Lausanne – New York – Oxford – Shannon – Singapore – Tokyo: 150-155; 1997.
- 2 Klinge, P. M.. **Diagnosis and Treatment of Adult Hydrocephalus** (chapter IV;23; pp 249-258); in: Samii's Essentials in Neurosurgery; Editors: Ramina R; Pires Aguiar PH; Tatabiba M. Springer Verlag; 2008.
- 3 Klinge, P.M. **Animal Models of Normal Pressure Hydrocephalus** (Part VII. pp 615-640) in:Animal Models of Dementia. Editors: Peter De Deyn and Debby Van Dam. Springer Verlag. Humana Press (Neuromethods 48 Wolfgang Walz, Series Editor) 2010
- 4 Klinge, P.M. **Arachnoid Cysts: Normal Pressure Hydrocephalus.** Editor: Rigamonti D., Cambridge University Press, Shaftesbury Road. 2013

OTHER PUBLICATIONS

- 1 Klinge PM. Book Review: Cerebrospinal Fluid Disorders: Lifelong Implications. published in Neurosurgery By: David Limbrick, Jeffrey Leonard, eds. Published by: Springer International Publishing AG, Cham, Switzerland,2019 Hardcover:387pp. Article DOI: 10.1093/neuros/nyz252

INVITED PRESENTATIONS (INTERNATIONAL AND NATIONAL)

- 1 Klinge, P.M. **International Guidelines in NPH.** Lecture at the 1. Lund International NPH Workshop, Lund-University/Sweden, May 2 – 4 2002.
- 2 Klinge, P.M. **Blood flow measurements in NPH.** Lecture at the 1. Lund International NPH Workshop, Lund-University/Sweden, May 2 – 4 2002.

- 3 Klinge, P.M. **NPH Follow-up Scales.** Lecture at the 1. Lund International NPH Workshop der Lund-University/Sweden, May 2 - 4 2002.
- 4 Klinge, P.M. **Der Normaldruckhydrozephalus beim älteren Menschen .**Lecture at the annual meeting of the German working committee Spina bifida and Hydrocephalus e.V.; Fulda, November 29 – 30 2002.
- 5 Klinge, P.M. **Updates in Diagnostic Evaluation and Management of Normal Pressure Hydrocephalus.** Lecture at the Hydrocephalus symposium at the 12th congress for the European Association of Neurological Surgeons(EANS) Lisbon, September 9 2003.
- 6 Klinge, P.M. **CSF in normal pressure hydrocephalus: diagnosis and treatment.** Lecture at the EKN symposium (Symposium on CSF in neurological diseases) Belgium, Alden Biesen, October 16 2003.
- 7 Klinge, Petra M. **Diagnosis and Treatment of Normal Pressure Hydrocephalus.** Lecture at the First STARS Symposium: Intracranial Pressure Control and Treatment in Hydrocephalus; Detroit, USA, May 21-22 2004.
- 8 Klinge, P.M.: **Updates on the Guidelines for Diagnosis and Management of Normal pressure hydrocephalus.** Lecture at the 2nd Lund International NPH Workshop Lund-University/Sweden; Lund, September 9 - 11 2004.
- 9 Klinge, P.M. **PET-CBF measurements in NPH.** Lecture at the 2nd Lund International NPH Workshop Lund-University/Sweden; Lund, September 9 -11 2004.
- 10 Klinge, P.M: **Evidence based approach of Guidelines for Diagnosis and Management of Idiopathic NPH.** Lecture at the Symposium “Hydrocephalus: Current and Future Challenges;” Birmingham, UK, October 14 - 15 2004.
- 11 Klinge, P.M. **The Diagnosis of NPH.** Lecture at the Hydrocephalus Workshop “1965-2005: NPH turns forty; but looks much younger” at the 13th World Congress of Neurosurgery Marrakech; June 19 - 23 2005.
- 12 Klinge, P.M. **Perspektiven der neurochirurgischen Behandlung des Normaldruckhydrozephalus.** Lecture at the satellite symposium (Update Normal Pressure hydrocephalus”) 78th annual congress of German Neurological Society Wiesbaden, September 21 - 24 2005.
- 13 Klinge, P. **Der Normaldruckhydrozephalus.** Lecture on the “Dementia Fair Congress” (German Federal Family Ministry); Bremen, February 7 - 8 2007.
- 14 Klinge, P. **Improving Outcomes in Hydrocephalus: Bridging the Gap between basic Science and Clinical Management.** H. Jones. Role of CSF circulation in protein clearance in Alzheimer’s disease and Normal Pressure Hydrocephalus. The National Institute of Neurological Disorders and Stroke and the STARS KID Foundation, September 14-15, 2009 Hyatt Regency, Baltimore, MD.

- 15 Klinge, P. **The practice guidelines for the diagnosis and management of NPH. History and perspectives.** Special session: The importance of Dr. Anthony Marmarou. Invited speaker at the 5th International Hydrocephalus workshop, Crete, Greece, 20th to 23rd of May 2010.
- 16 Klinge, P. **Hydrocephalus Management.** Depuy Residents Weekend. Codman Neurosurgery&Endovascular Course. Moderator: Petra M. Klinge. Saturday August 14th, 2010, Raynham, MA
- 17 Klinge, P. **Adult Hydrocephalus Pathophysiology: Progressive neurodegenerative disorder?.** Breakfast seminar: Contemporary management for Adult Hydrocephalus. Moderator: Guy M. McKhann II, MD. Lecture at the AANS meeting in Denver, Colorado, April 9th to 13th 2011
- 18 Klinge P. **Hydrocephalus and associated CSF disorders. Key note Lecture at the conference “Hydrocephalus 2011”** on behalf of the 4th Annual meeting of the ISHCSF, September 4th to 7th 2011, Copenhagen, Denmark.
- 19 Petra M. Klinge, MD. **Contemporary Management of Congenital Nervous System Disorders.** Hasbro Children’s Hospital New Concepts, Therapies and Procedures:An Update for Pediatricians. October 1, 2011, Faculty at the Inaugural Continuing Medical Education Symposium at the new home of the Warren Alpert Medical School of Brown University 222 Richmond Street Providence, RI 02912
- 20 Klinge P. **“ Idiopathic Normal Pressure Hydrocephalus – Neurosurgical Management of Dementia.** Presentation and Faculty at The Aging Brain Symposium. November 19th 2011, Marriott Hotel, Providence, RI
- 21 Klinge, P. **Adult Hydrocephalus Pathophysiology. Breakfast seminar: Contemporary management for Adult Hydrocephalus.** Moderator: Guy M. McKhann II, MD. Invited Faculty and Lecture at the AANS meeting in Miami, Florida, April 18th 2012.
- 22 Klinge P. European NPH study: **NPH outcome scale and predictors of outcome.** Presentation at the meeting of the IHIWG meeting in conjunction with the Annual Meeting of the American Society of Neuroradiology (ASNR), Hilton Hotel, New York, April 26-27, 2012.
- 23 Klinge P. European NPH study: **NPH outcome scale and predictors of outcome.** Presentation as Faculty on the Normal Pressure Hydrocephalus Symposium. Chair: Daniele Rigamonti. Annual Meeting of the Congress of Neurological Surgeons (CNS), Chicago, October 8th 2012.
- 24 Klinge P. **Sports concussions.** Symposium on Sports Concussions&Cervical Spine Injuries: Back to School and Back to Work for the Pediatrician and Pediatric Neurosurgeon. Hope Club, 6 Benevolent Street, Providence. January 29th 2013.

- 25 Klinge P., Luks, F. **Management of children with spina bifida in the age of fetal intervention.** Presentation at the 2013 Neonatal Pediatric GI Summit Wednesday, Crowne Plaza, Warwick, RI, March 20, 2013
- 26 Klinge P. **Adult Hydrocephalus Pathophysiology and Evaluation.** Breakfast seminar: Contemporary management for Adult Hydrocephalus. Moderator: Guy M. McKhann II, MD. Invited Faculty and Lecture at the AANS meeting in New Orleans, Mississippi, April 29th 2013.
- 27 Klinge P. **2005 NPH practice guidelines revisited: Lessons learned from the European prospective.** NPH trial and status of normal pressure Hydrocephalus management. Keynote Lecture at the Fifth meeting of the International Society of Hydrocephalus and CSF disorders “ Hydrocephalus 2013 Athens”, Athens, Greece, June 29th to July 2nd, 2013.
- 28 Klinge P. **Adult Hydrocephalus Pathophysiology and Evaluation.** Breakfast seminar: Contemporary management for Adult Hydrocephalus. Moderator: Guy M. McKhann II, MD. Invited Faculty and Lecture at the AANS meeting in San Francisco, CA, April 5-9, 2014.
- 29 Klinge P. **Transition of Care -Translation of Cerebrospinal fluid Research into Care and Transition.** Faculty Speaker at the 13th National Conference on Hydrocephalus, Hydrocephalus Association, Portland, OR, July 9-11, 2014
- 30 Klinge PM. **Tethered Cord in EDS.** Faculty Speaker at the ICL&McMaster at the 2nd Annual Canadian Conference. Difficult to diagnose Disease: Ehlers-Danlos Syndrome. Toronto, CA, November 1st, 2014
- 31 Klinge P. **Adult Hydrocephalus Pathophysiology and Evaluation.** Breakfast seminar: Contemporary management for Adult Hydrocephalus. Moderator: Guy M. McKhann II, MD. Invited Faculty and Lecture at the AANS meeting in Washington, DC, May 2nd to 6th, 2015.
- 32 Klinge P. **TETHERED CORD SYNDROME in EHLERS-DANLOS –Diagnostic criteria, Surgical Indication and Filum pathology.** Annual Meeting of the National Meeting of the Ehlers Danlos Society. Baltimore, MA, August 13th to 14th, 2015.
- 33 Klinge P. **Tethered cord release in EDS: A practical approach to understanding surgical criteria and supporting data outcomes.** Faculty Speaker at the ICL&McMaster at the 3rd Annual Canadian Conference. Difficult to diagnose Disease: Ehlers-Danlos Syndrome. Toronto, CA, November 6th to 7th, 2015
- 34 Klinge P. **Adult Hydrocephalus Pathophysiology and Evaluation.** Breakfast seminar: Contemporary management for Adult Hydrocephalus. Moderator: Guy M. McKhann II, MD. Invited Faculty and Lecture at the AANS meeting in Chicago, IL, April 30th to May 4th, 2016.
35. Klinge P . Normal pressure Hydrocephalus. Breakfast seminar. WSSFN 2019, June 24th to 27th 2019, NY

36. *Since 2016 to present, various recorded and published presentations at national and international meetings at the Bobby Jones, Chiari&Syringomyelia Foundation, EDS International Society, EDS national society meetings, ASAP (American Syringomyelia & Chiari Alliance Project) [petra klinge - Google Search](#)*

GRANTS

“Encapsulation Technologies for Intracerebral Application of Endostatin in Glioblastoma Treatment” 12/2003-6/2004. Principal investigator. Sponsor International Neurobionik Foundation Rudolf-Pichlmayr-Strasse 4, 30625 Hannover (www.neurobionik-stiftung.de) 30,000 €

“Experimental Studies on the AD-related pathology in Kaolin-induced hydrocephalus of the ageing rat.” Investigator. Sponsor EUNOE Science, CA, USA 06/2003-06/2005 10,000 €

German Ministry of Research Project” ANCI, **“Sub-project: “Stem-cell therapy in brain tumors.”** 01/2005 – 01/2007 Investigator 200,000€

“European Multicenter Study on the prediction of outcome in idiopathic hydrocephalus.” Principal Investigator, 08/2004–12/2008 Sponsor Codman & Shurtleff, \$250 000

“Hydrocephalus 2008” Hannover, Principal Investigator Sponsors :Codman & Shurtleff 36,000 € Aesculap AG & Co. KG, 25,000, MEDTRONIC 12,500 € INTEGRA 5,000 € Möller Medical GmbH & Co KG, 5,000 €

Foundation/creation of the International Society Hydrocephalus and cerebrospinal disorders 09/2007 Sponsor Codman & Shurtleff 5,000 €, MEDTRONIC 5,000 \$

“ Randomized multicenter trial on shunt treatment in NPH”, 2012 – present. RIH in Collaboration with John’s Hopkins, Sponsor Aesculap AG, 125000 \$ each center

“ Identification of Novel CSF biomarkers in idiopathic NPH” 2019 – present. BROWN CARNEY INSTITUTE GRANT 50 000\$ with continued funding (A. Fleischman, M.G. Ruoco, P. Klinge, T. Serre).