

# CURRICULUM VITAE [Updated September 2015]

## Rune Aaslid

Born June 14 1943 in Volda, Norway

### Education and Degrees

- 1988: Privatdozent (PD) in Neurosurgical Research, University of Berne, Berne, Switzerland.
- 1975: Dr Philos (PhD) in Cardiovascular Physiology, Medical Faculty, University of Oslo, Oslo, Norway.
- 1968: Sivilingenieur (MS) in Engineering Cybernetics and Electrical Engineering, The Norwegian Institute of Technology (NTH), Trondheim, Norway.

### Career Positions

- 1998 – present: Director of Research, Hemodynamics AG, Berne, Switzerland.  
(<http://www.hemodynamic.com/>)
- 1989 – present: Privatdozent, (Affiliate Associate Professor), Department of Neurosurgery and Neurovascular Laboratory, University of Berne, Berne, Switzerland.
- 1991 – present: Affiliate Associate Professor of Neurosurgical Research, University of Washington, Seattle, Washington, USA.
- 1988 – 91: Director of Neurosurgical Research, Inselspital, University of Berne, Berne, Switzerland.
- 1985 – 87: Director of Cardiovascular Research, Institute of Applied Physiology and Medicine (IAPM) Seattle, Washington, USA.
- 1983 – 84: Senior Research Fellow, Department of Neurosurgery, Rikshospitalet, Oslo, Norway.
- 1981 – 83: Senior Research Fellow (Wissenschaftlicher Beamter), Department of Neurosurgery, Inselspital, University of Berne, Berne, Switzerland
- 1976 – 79: Adjunct Associate Professor of Biocybernetics, Division of Engineering Cybernetics, Department of Electrical Engineering, the Norwegian Institute of Technology (NTH), Trondheim, Norway.
- 1969 – 75: Research assistant, Institute of Surgical Research, Rikshospitalet, University of Oslo, Oslo, Norway; and Division of Engineering Cybernetics, Department of Electrical Engineering, the Norwegian Institute of Technology (NTH), Trondheim, Norway.

### Some Research Milestones

- 1998-2012: Developed the first transcranial Doppler instrument capable of portable ambulatory monitoring for cerebral emboli. [78, 80, 84].
- 1998-2008: Created the first interactive computer program for teaching cerebral hemodynamics and the principles and clinical use of transcranial Doppler. The i-book format integrates educational text with a comprehensive model of the cerebral circulation and a realistic rendering of pulsed

Doppler and other instruments. Three-D simulation of anatomy and ultrasound insonation is also included in the newest version [ <http://www.transcranial.com> ].

- 1989-2007: Introduced and developed the use of transcranial Doppler for quantitative assessment of dynamic cerebral autoregulation. [42, 49, 60, 61, 63, 65, 66, 68, 83]. *Publication [42] is currently ranked 21<sup>st</sup> among the 50 most cited papers in Stroke.*
- 1987: Introduced functional transcranial Doppler for study and quantification of evoked flow responses and the dynamic relationship between brain function and blood flow. [38]
- 1984: Introduced cerebral vasospasm evaluation by transcranial Doppler. [18, 19, 20, 26, 69, 70] *Publication [18] is ranked 43rd among the most cited in neurosurgical journals according to a recent paper (J Neurosurg 112:223–232, 2010)*
- 1982: Developed and introduced the transcranial Doppler method [17]. *This publication is the second most cited in neurosurgical journals (J Neurosurg 112:223–232, 2010)*
- 1981: Invented and evaluated a new noninvasive blood pressure measurement method. [15] This technique permits recording of instantaneous and mean blood pressure with accuracy and resolution comparable to invasive methods.
- 1976: Cooperated on the first study describing a method for noninvasive assessment of pressure gradient in mitral valve stenosis. [5] Dr. Holen was the main contributor to this achievement.
- 1975: Described a new and accurate method of quantifying the efficiency of prosthetic heart valves. [3]

## Editorial Appointments

- 1990 – 92: Member of the Editorial Board of Stroke.
- 1989 – present: Member of the Editorial Board of Neurosonology.
- 1987 – present: Ad Hoc reviewer for Stroke and various other journals.

## Other Editorial

- 1999: Coeditor, Neurosurgical management of aneurysmal subarachnoid haemorrhage [69, 70]
- 1992: Coeditor, Transcranial Doppler [53]
- 1986: Editor, first book on Transcranial Doppler Sonography [28-30]

## Publications in Peer Reviewed Journals and Books

1. Aaslid R, Brubakk AO: [Dynamic pressure-flow relationship of the human aorta]. Ver Dtsch Ges Kreislaufforschg 1973; 40:154-158
2. Aaslid R: Simulation of the individual cardiovascular system: A pilot study. PhD thesis, Medical Faculty, University of Oslo and Report No. 74-51-W Division of Engineering Cybernetics, The Norwegian Institute of Technology 1974
3. Aaslid R, Levang O, Froysaker T, Skagseth E, Hall KV: "In situ" evaluation of the aortic pivoting disc valve prosthesis. Scand J Thor Cardiovasc Surg 1975; 9:81-84

4. Nornes H, Magnes B, Aaslid R: Observations on intracranial pressure plateau waves, in Lundberg N, Ponten U, Brock M: Intracranial Pressure. Springer Verlag, Berlin-Heidelberg-New York 1975
5. Holen J, Aaslid R, Landmark K, Simonsen S: Determination of pressure gradient in mitral stenosis with a noninvasive ultrasound Doppler technique. *Acta Med Scand* 1976; 199:455-460
6. Aaslid R, DiStefano III J, Balchen JG: Modeling of the hormonal state of fishes. Report STF48 A76081, SINTEF, Trondheim 1976
7. Aaslid R: [Biocybernetics, textbook in Norwegian] Report no 75-110X, Division of Engineering Cybernetics, University of Trondheim, Trondheim 1975
8. Holen J, Aaslid R, Landmark K, Simonsen S, Ostrem T: Determination of the effective orifice area in mitral stenosis from noninvasive ultrasound Doppler data and mitral flow rate. *Acta Med Scand* 1977; 201:83-88
9. Nornes H, Aaslid R, Lindegaard KF: Intracranial pulse pressure dynamics in patients with intracranial hypertension. *Acta Neurochir* 1977; 38:177-186
10. Brubakk AO, Aaslid R: A model approach to studying cardiovascular function in man, in Perkins WJ: Biomedical Computing. Pitman Medical UK, 1977
11. Brubakk AO, Aaslid R: Use of a model for simulating individual aortic dynamics in man. *Med Biol Eng Comput* 1978; 16:231-242
12. Piene H, Aaslid R, Hansen M, Sund T: Simple system for analog data transmission from the physiological research laboratory to a digital computer. *Ann Biom Eng* 1978; 6:161-166
13. Sudmann E, Aaslid R: A synchronization control unit for super 8 sound recording, editing and sound transfer to magnetic-striped film. *Society of Motion Picture and Television Engineers Journal* 1978; 87:158-162
14. Giltvedt J, Aaslid R: Timesaving method for segmental pressure measurements. *Med Biol Eng Comput* 1981; 19:775-776
15. Aaslid R, Brubakk AO: Accuracy of an ultrasound Doppler servo method for noninvasive determination of instantaneous and mean arterial blood pressure. *Circulation* 1981; 64:753-759
16. Hetland O, Warhuus K, Giercksky KE, Aaslid R, Prydz H: Toxicity of phospholipase C in rabbits. *Scand J Clin Lab Invest* 1982; 42:239-244
17. Aaslid R, Markwalder T-M, Nornes H: Noninvasive transcranial Doppler ultrasound recording of flow velocity in basal cerebral arteries. *J Neurosurg* 1982; 57:769-774
18. Aaslid R, Huber P, Nornes H: Evaluation of cerebrovascular spasm with transcranial Doppler ultrasound. *J Neurosurg* 1984; 60:37-41
19. Aaslid R, Nornes H: Musical Murmurs in human cerebral arteries after subarachnoid hemorrhage. *J Neurosurg* 1984; 60:32-36
20. Aaslid R, Huber P, Nornes H: Noninvasive transcranial Doppler ultrasound recording in basal cerebral arteries - A new approach to evaluation of cerebrovascular spasm, in Voth D, Glee P (eds): *Cerebral Vasospasm*. Walter de Gruyter, Berlin-New York, 1984
21. Markwalder T-M, Grolimund P, Seiler RW, Roth F, Aaslid R: Dependency of blood velocity in the middle cerebral artery on en-tidal carbon dioxide partial pressure - A transcranial ultrasound Doppler study. *J Cereb Blood Flow Metab* 1984; 4:368-372
22. Lindegaard K-F, Bakke SJ, Grolimund P, Aaslid R, Huber P, Nornes H: Carotid artery disease: Assessment of intracranial hemodynamic pattern by noninvasive transcranial Doppler. *J Neurosurg* 1985; 63:890-898

23. Lundar T, Lindegaard K-F, Froysaker T, Aaslid R, Wiberg J, Nornes H: Cerebral perfusion during nonpulsatile cardiopulmonary bypass. *Ann Thorac Surg* 1985; 40:144-150
24. Lundar T, Lindegaard K-F, Froysaker T, Aaslid R, Wiberg J, Nornes H: Dissociation between cerebral autoregulation and CO<sub>2</sub> reactivity during nonpulsatile cardiopulmonary bypass. *Ann Thorac Surg* 1986; 40:582-588
25. Seiler RW, Aaslid R, Grolimund P: Correlation of the middle cerebral artery flow velocity with the clinical course and CT-visualized subarachnoid blood in patients after aneurysm surgery, in Auer LM (ed): *Timing of aneurysm surgery*. Walter de Gruyter, Berlin-New York, 1985
26. Aaslid R, Huber P, Nornes H: A transcranial Doppler method in the evaluation of cerebrovascular spasm. *Neuroradiology* 1986; 28:11-16
27. Seiler RW, Grolimund P, Aaslid R, Huber P, Nornes H: Cerebral vasospasm evaluated by transcranial ultrasound correlated with clinical grade and CT-visualized subarachnoid hemorrhage. *J Neurosurg* 1986; 64:594-600
28. Aaslid R: Transcranial Doppler examination techniques, in Aaslid R (ed): *Transcranial Doppler sonography*, Springer, Vienna-New York, 1986
29. Aaslid R: The Doppler principle applied to measurement of blood flow velocity in cerebral arteries, in Aaslid R (ed): *Transcranial Doppler sonography*, Springer, Vienna-New York, 1986
30. Aaslid R, Lindegaard K-F: Cerebral Hemodynamics, in Aaslid R (ed): *Transcranial Doppler sonography*, Springer, Vienna-New York, 1986
31. Lindegaard K-F, Aaslid R, Nornes H: Cerebral arteriovenous malformations, in Aaslid R (ed): *Transcranial Doppler sonography*, Springer, Vienna-New York, 1986
32. Seiler RW, Aaslid R: Transcranial Doppler for evaluation of cerebral vasospasm, in Aaslid R (ed): *Transcranial Doppler sonography*, Springer, Vienna-New York, 1986
33. Aaslid R, Lundar T, Lindegaard K-F, Nornes H: Estimation of cerebral perfusion pressure from arterial blood pressure and transcranial Doppler recordings, in Miller JD et al (eds): *Intracranial Pressure VI*. Springer-Verlag, Berlin-Heidelberg-New York, 1986, pp226-229
34. Lindegaard K-F, Grolimund P, Aaslid R, Nornes H: Evaluation of cerebral AVM's using transcranial Doppler ultrasound. *J Neurosurg* 1986; 65:335-344
35. Lindegaard K-F, Bakke SJ, Aaslid R, Nornes H: Doppler diagnosis of intracranial artery occlusive disorders. *J Neurol Neurosurg Psychiat* 1986; 47:510-518
36. Aaslid R: [Future possibilities in transcranial Doppler sonography - in German], in Widder B (ed): *Transcranielle Doppler-Sonographie bei zerebrovascularen Erkrankungen*. Springer-Verlag, New York-Berlin-Heidelberg, pp 25-29, 1987
37. Aaslid R: Transcranial Doppler diagnosis, in Spencer MP (ed): *Ultrasonic diagnosis of cerebrovascular disease*. Martinus Nijhoff Publishers, Dordrech, 1987, pp 227-240
38. Aaslid R: Visually evoked dynamic blood flow response of the human cerebral circulation. *Stroke* 1987; 18:771-775
39. Grolimund P, Seiler RW, Aaslid R, Huber P, Zurbruegg M: Evaluation of cerebrovascular disease by combined extracranial and transcranial Doppler sonography: Experience in 1039 patients. *Stroke* 1987; 18:1018-1024
40. Lindegaard K-F, Lundar T, Wiberg J, Sjoberg D, Aaslid R, Nornes H: Variations in middle cerebral artery blood flow investigated with noninvasive transcranial blood velocity measurements. *Stroke* 1987; 18:1024-1030

41. Adams RJ, Aaslid R, el Gammal T, Nichols FT, McKie V: Detection of cerebral vasculopathy in sickle cell disease using transcranial Doppler ultrasonography and magnetic resonance imaging. Case report, *Stroke* 1988; 19:518-520
42. Aaslid R, Lindegaard K-F, Sorteberg W, Nornes H: Cerebral autoregulation dynamics in humans. *Stroke* 1989; 20:45-52
43. Steiger HJ, Aaslid R, Keller S, Reulen HJ: Strength, elasticity and viscoelastic properties of cerebral aneurysms. *Heart Vessels* 1989; 5:41-46
44. Steiger HJ, Aaslid R, Keller S, Reulen HJ: Growth of aneurysms can be understood as passive yield to blood pressure. An experimental study. *Acta Neurochir (Wien)* 1989; 100:74-78
45. Augustyniak E, Swietliczko I, Aaslid R: [Evaluation of blood flow velocity and pulsation curves in the posterior ciliary arteries in glaucoma - in Polish.] *Klin Oczna* 1989; 91:3-6
46. Adams RJ, Nichols FT, Aaslid R, McKie VC, McKie K, Carl E, Stephens S, Thompson WO, Milner P, Figueroa R: Cerebral vessel stenosis in sickle cell disease: Criteria for detection by transcranial Doppler. *Am J Pediatric Hematol Oncol* 1990; 12:277-282
47. Aaslid R, Groger U, Patlak CS, Fenstermacher JD, Huber P, Reulen HJ: Fluid flow rates in human peritumoural Oedema. *Acta Neurochir Suppl (Wien)* 1990; 51:152-154
48. Nornes H, Sorteberg W, Nakstad P, Bakke SJ, Aaslid R, Lindegaard K-F: Haemodynamic aspects of clinical cerebral angiography - concurrent two vessel monitoring using transcranial Doppler ultrasound. *Acta Neurochir (Wien)* 1990; 105:89-97
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50. Aaslid R, Bondar, RL, Kassam MS, Stein F, Dunphy PT. Cerebral autoregulation in microgravity. *Proceedings, Spacebound '91, Ottawa, ON.* 1991; 224-227.
51. Sullivan PJ, Thirsk R, Goodman L, Ackles K, Pecaric M, Bondar R, Kassam MS, Aaslid R, Dunphy PT, Stein F. Evaluation of an experimental antigravity suit for astronauts. *Proceedings, Seventh Conference on Astronautics, Canadian Aeronautics and Space Institute, Ottawa, ON.* 1992; 54-58.
52. Aaslid R: Principles of transcranial Doppler measurements, in Olesen J (ed): *Migraine and other headaches: the vascular mechanisms.* New York: Raven Press 1991;253-259
53. Aaslid R: Cerebral hemodynamics, in Newell DW, Aaslid R eds. *Transcranial Doppler.* New York: Raven Press 1992; pp49-55
54. Newell DW, Aaslid R: Transcranial Doppler: clinical and experimental uses. *Cerebrovasc Brain Metab Rev* 1992; 4:122-143
55. Newell DW, Aaslid R, Stooss R, Reulen HJ: The relationship of blood flow velocity fluctuations to intracranial pressure B waves. *J Neurosurg* 1992; 76:415-421
56. Steiger HJ, Aaslid R, Stooss R: Dynamic computed tomographic imaging of regional cerebral blood flow and blood volume. A clinical pilot study. *Stroke* 1993; 24:591-597
57. Giller CA, Aaslid R: Estimates of pulse wave velocity and measurement of pulse transit time in the human cerebral circulation. *Ultrasound Med Biol* 1994; 20:101-105
58. Newell DW, Aaslid R, Lam A, Mayberg TS, Winn HR: Comparison of Flow and velocity during dynamic autoregulation testing in humans. *Stroke* 1994; 25:793-797
59. Steiger HJ, Aaslid R, Stooss R, Sailer RW: Transcranial Doppler monitoring in head injury: relations between type of injury, flow velocities, vasoreactivity, and outcome. *Neurosurgery* 1994; 34:79-85

60. Tiecks FP, Lam AM, Aaslid R, Newell DW: Comparison of static and dynamic autoregulation measurements. *Stroke* 1995; 26:1014-19
61. Strebel S, Lam AM, Matta B, Mayberg TS, Aaslid R, Newell DW: Dynamic and static autoregulation during Isoflurane, Desflurane and Propofol anaesthesia. *Anesthesiology* 1995; 83:66-76
62. Baumgartner RW, Mattle HP, Aaslid R: Transcranial color-coded duplex sonography, magnetic resonance angiography, and computed tomography angiography: methods, applications, advantages, and limitations. *J Clin Ultrasound* 1995; 23:89-111
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64. Sturzenegger M, Newell DW, Aaslid R: Visually evoked blood flow response assessed by simultaneous two-channel transcranial Doppler using flow velocity averaging. *Stroke* 1996; 27:2256-2261
65. Newell DW, Aaslid R, Stooss R, Seiler RW, Reulen HJ: Evaluation of hemodynamic responses in head injury patients with transcranial Doppler monitoring. *Acta Neurochir (Wien)* 1997; 139:804-817
66. Junger EC, Newell DW, Grant GA, Avellino AM, Ghatan S, Douville CM, Lam AM, Aaslid R, Winn HR: Cerebral autoregulation following minor head injury. *J Neurosurg* 1997; 87:485-486
67. Seidel G, Beller KD, Aaslid R, Hummel RP, Thibaut U, Vidal-Langwasser M, Kukat B, Kaps M: The influence of different gases on acoustic properties of a spherosome-based ultrasound contrast agent (BY963). A transcranial Doppler sonography study. *J Neuroimaging* 1998; 8:83-87
68. Doering TJ, Aaslid R, Steuernagel B, Brix J, Niederstadt C, Breull A, Schneider B, Fischer GC: Cerebral autoregulation during whole-body hypothermia and hyperthermia stimulus. *Am J Phys Med Rehabil* 1999; 78:33-38
69. Aaslid R: Hemodynamics of cerebrovascular spasm. *Acta Neurochir [Suppl]* 1999;72: 47-57
70. Langmoen IA, Lundar T, Aaslid R, Reulen H-J eds. Neurosurgical management of aneurysmal subarachnoid haemorrhage. *Acta Neurochir [Suppl 72]* 1999
71. Aaslid R: Hemodynamics of cerebrovascular spasm. *Acta Neurochir [Suppl 72]* 1999;72:47-57
72. Newell DW, Eskridge JM, Aaslid R. Current indications and results of cerebral angioplasty. *Acta Neurochir Suppl.* 2001; 77:181-183
73. Aaslid R: Transcranial Doppler assessment of cerebral vasospasm. *Eur J Ultrasound.* 2002;16: 3-10
74. Vavilala MS, Newell DW, Junger E, Douville CM, Aaslid R, Rivara FP, Lam AM. Dynamic cerebral autoregulation in healthy adolescents. *Acta Anaesthesiol Scand.* 2002; 46:393-397.
75. Park CW, Sturzenegger M, Douville CM, Aaslid R, Newell DW. Autoregulatory response and CO<sub>2</sub> reactivity of the basilar artery. *Stroke.*2003; 34:34-39.
76. Blaha M, Aaslid R, Douville CM, Corraera R, Newell DW. Cerebral blood flow and dynamic cerebral autoregulation during ethanol intoxication and hypercapnia. *J Clin Neurosci.* 2003; 10:195-198.
77. Aaslid R, Lash SR, Bardy GH, Gild WH, Newell DW. Dynamic pressure--flow velocity relationships in the human cerebral circulation. *Stroke.* 2003; 34: 1645-1649.
78. Mackinnon AD, Aaslid R, Markus HS. Long-term ambulatory monitoring for cerebral emboli using transcranial Doppler ultrasound. *Stroke.* 2004;35:73-78
79. Aaslid R, Newell DW. Response: Limitations in Estimating Critical Closing Pressure by Noninvasive Blood Pressure Measurements. *Stroke* 2004; 35:e91-e92
80. Mackinnon AD, Aaslid R, Markus HS: Ambulatory transcranial Doppler cerebral embolic signal detection in symptomatic and asymptomatic carotid stenosis. *Stroke* 2005;36:1726-1730

81. Aaslid R: Cerebral autoregulation and vasomotor reactivity. In Baumgartner RW (ed): Handbook on neurovascular ultrasound. Front. Neurol. Neurosci, Basel, Karger 2006;21:1-13
82. Aaslid R, Blaha M, Sviri G, Douville CM, Newell DW. Asymmetric dynamic cerebral autoregulatory response to cyclic stimuli. Stroke 2007; 38:1465-69
83. Sviri GE, Aaslid R, Douville CM, Moore A, Newell DW. Time course for autoregulation recovery following severe traumatic brain injury. J Neurosurg. 2009; 111(4):695-700
84. Truijman MT, de Rotte AA, Aaslid R, van Dijk AC, Steinbuch J, Liem MI, Schreuder FH, van der Steen AF, Daemen MJ, van Oostenbrugge RJ, Wildberger JE, Nederkoorn PJ, Hendrikse J, van der Lugt A, Kooi ME, Mess WH. Intraplaque hemorrhage, fibrous cap status, and microembolic signals in symptomatic patients with mild to moderate carotid artery stenosis: the Plaque at RISK study. Stroke 2014; 45:3423-6