

„...Neuropsychology meets Neurosurgery...“  
(auf dem Weg zu einer kognitiven Neurochirurgie)

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Universität Basel

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Der Papyrus Edwin Smith wurde 1862 in Ägypten gefunden. Er wurde ca. 1500 v. Chr. verfasst und basiert auf Schriften, die bereits um 3000 v. Chr. existierten...

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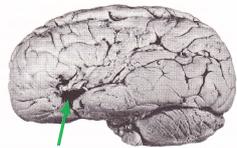
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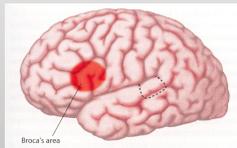
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Pierre-Paul Broca (1824-1880)



Gehirn des Patienten „Tan“



Broca's area

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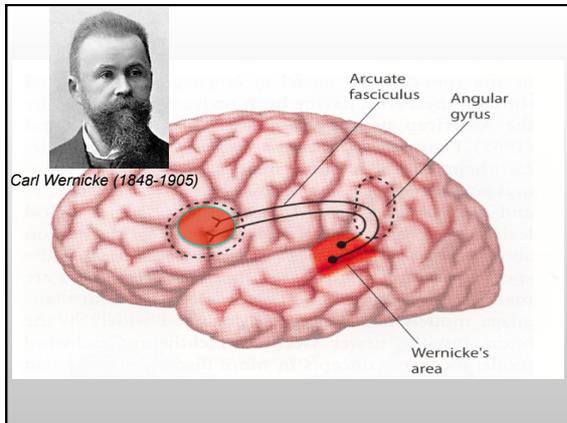
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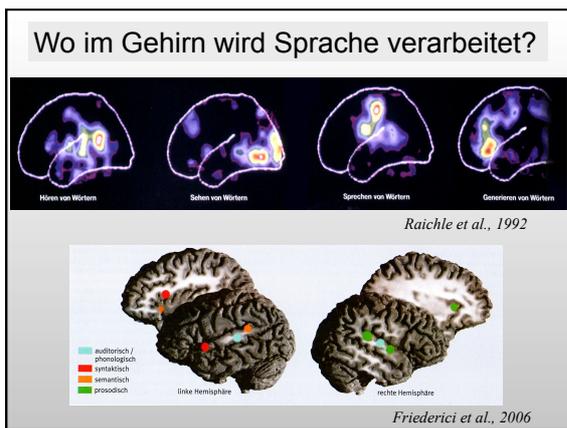
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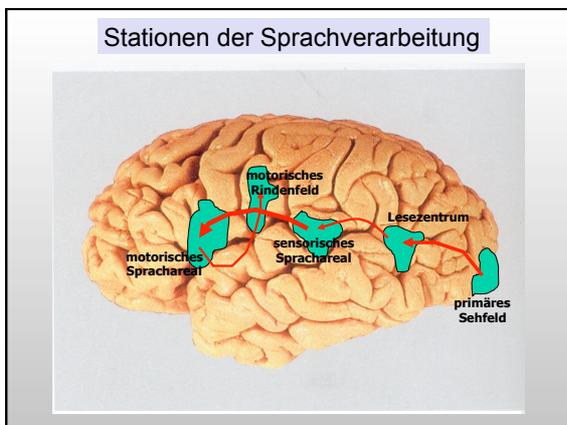
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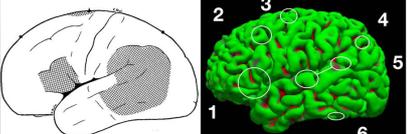
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• Human Brain Mapping 16(4):319–325 (2017) •

### Presurgical Language fMRI: Mapping of Six Critical Regions

Christopher F. Benjamin<sup>1,2,4</sup>, Patricia D. Walshaw<sup>2</sup>, Kayleigh Hale,<sup>4</sup>  
 William D. Gaillard,<sup>3</sup> Leslie C. Baxter,<sup>5</sup> Madison M. Bert,<sup>1</sup>  
 Monika Polczynska,<sup>6</sup> Stephanie Noble,<sup>7</sup> Rafeed Alkawadri,<sup>1</sup>  
 Lawrence J. Hirsch,<sup>8</sup> R. Todd Constable,<sup>9</sup> and Susan V. Bookheimer<sup>2</sup>

<sup>1</sup>Department of Neurology, Comprehensive Epilepsy Center, Yale School of Medicine, New Haven, Connecticut  
<sup>2</sup>Department of Neurosurgery, Yale School of Medicine, New Haven, Connecticut  
<sup>3</sup>UCLA Department of Psychiatry and Biobehavioral Sciences, Los Angeles, California  
<sup>4</sup>U.S. Department of Veterans Affairs, War Related Illness and Injury Study Center, Washington, DC  
<sup>5</sup>Center for Neuroscience Research, Children's National Health System, Washington, DC  
<sup>6</sup>Department of Neuroimaging Research, Barrow Neurological Institute, Phoenix, Arizona  
<sup>7</sup>Faculty of English, Adam Mickiewicz University, Poznań, Poland  
<sup>8</sup>Department of Radiology and Biomedical Imaging, Yale School of Medicine, New Haven, Connecticut




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NeuroImage  
 www.elsevier.com/locate/neuroimage  
 NeuroImage 37 (2007) 5100–5108

### Object naming is a more sensitive measure of speech localization than number counting: Converging evidence from direct cortical stimulation and fMRI

Nicole M. Petrovich Brennan, Stephen Whalen, Daniel de Moraes Branco, James P. O'Shea, Isaiah H. Norton, and Alexandra J. Golby\*

Department of Neurological Surgery, Brigham and Women's Hospital and Harvard Medical School, 75 Francis Street, C/A 130-F, Boston, MA 02115, USA

	Object Naming → Number Counting			Number Counting → Object Naming		
Controls						
Patients						

Um Sprachrelevante Areale zuverlässig einzugrenzen ist das Zählen nicht ausreichend (da überlernt und automatisiert)! Das Benennen im ganzen Satz (z.B. „...dies ist ein Mantel ...“, den kann man anziehen...“) eignet sich besser, da hierdurch komplexere Netzwerke aktiviert werden.

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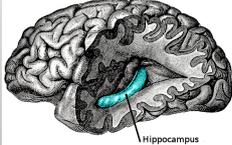
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## Der Fall H.M.



Dieser Pat. (geb. 1926) hatte mit 10J. erstmals epileptische Anfälle, mit 16 Jahren seinen 1. GM. Nach d. 20 Lebensjahr hatte HM ca. 10 Anfälle am Tag. Man führte eine radikale Operation durch. Die OP erfolgte am 01. Sept. 1953 und wurde von den ausführenden Chirurgen als „frankly experimental“ bezeichnet...



Henry Molaison (genannt H.M.),  
 geb. 26.02.1926, gest. 02. Dez. 2008

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Bestimmte Hirnregionen sind für bestimmte, spezialisierte Funktionen relevant...




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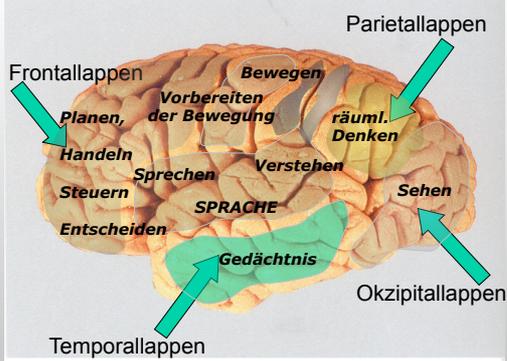
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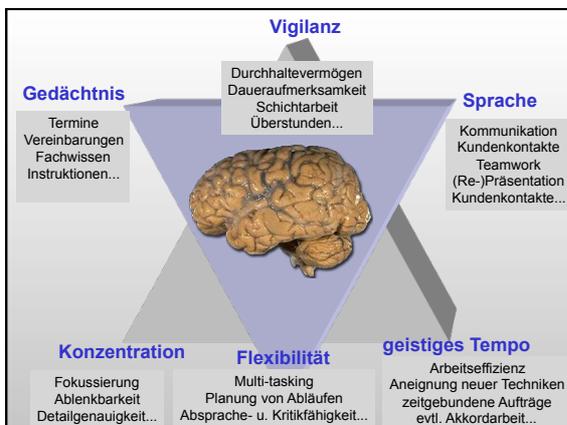
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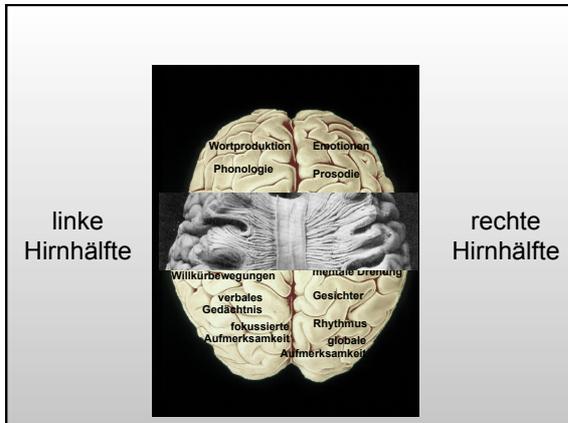
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Die Wachcraniotomie hat einen hohen Stellenwert, wenn sich hirneigene Tumoren (z.B. Gliome, Astrozytome) in unmittelbarer Nähe zu funktionell relevanten Hirngebieten (Bewegung, Sprache, Denken) befinden, deren Funktionen unter Vollnarkose nicht beobachtet und beurteilt werden können.

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Aus klinischen Studien ergeben sich Hinweise, dass so radikal wie möglich ausgeführte Tumorentfernungen die Chance der adjuvanten Behandlungen (Chemo und/oder Strahlentherapie) verbessern und die Überlebensdauer der Patienten verlängern.

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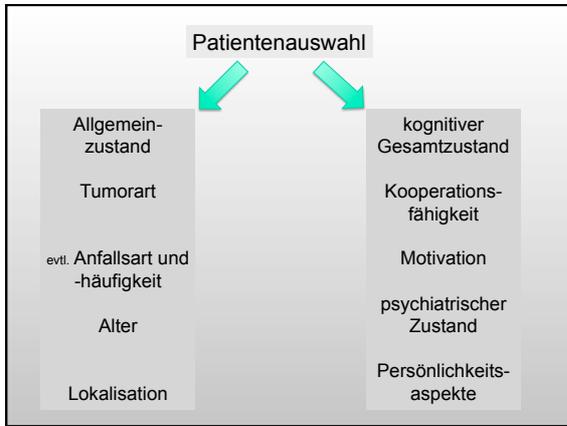
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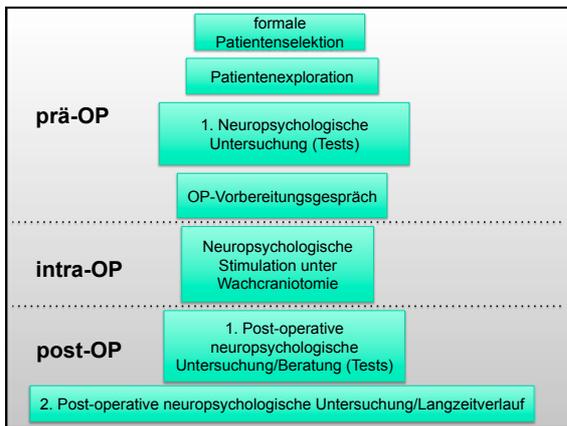
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ORIGINAL RESEARCH  
published: 16 August 2017  
doi: 10.3389/fonc.2017.021119

## Welche Vorteile bringt das neuropsychologische Monitoring?

### Resection of Gliomas with and without Neuropsychological Support during Awake Craniotomy—Effects on Surgery and Clinical Outcome

Anna Klein<sup>1</sup>, Nico Soffmann<sup>1\*</sup>, Sebastian Ilse<sup>1\*</sup>, Bernhard Meyer<sup>1</sup>, Florian Ringel<sup>2†</sup> and Sandro M. Krieg<sup>1,3†</sup>

**FIGURE 1** | Duration of surgery. Box plot of duration of surgery for the neuropsychological (NP) and the non-NP group with median, interquartile, and maximum values and quartile values. There was a statistically significant difference in the duration of surgery between both groups ( $p < 0.05$ ).

**FIGURE 2** | Resection rates. Bar chart of gross total resection (GTR) in % for the neuropsychological (NP) and non-NP group. GTR was achieved in 65.2% of patients in the NP group and 28.8% of patients in the non-NP group according to magnetic resonance imaging (MRI) performed after surgery ( $p < 0.05$ ).

**FIGURE 3** | Surgery-related language deterioration. Bar chart comparing surgery-related language deterioration between the neuropsychological (NP) and non-NP group. In the NP group, 55.2% of patients showed no new surgery-related deficits, whereas language deficits occurred in 44.8% of the patients. In the non-NP group, no new surgery-related deficits were documented for 57.1% of patients, whereas 42.9% of the patients were diagnosed with language deficits and the remaining 14.3% of the patients suffered from permanent deficits. Resection surgery-related permanent deficits were seen in 70% statistically significant difference between groups ( $p < 0.05$ ).

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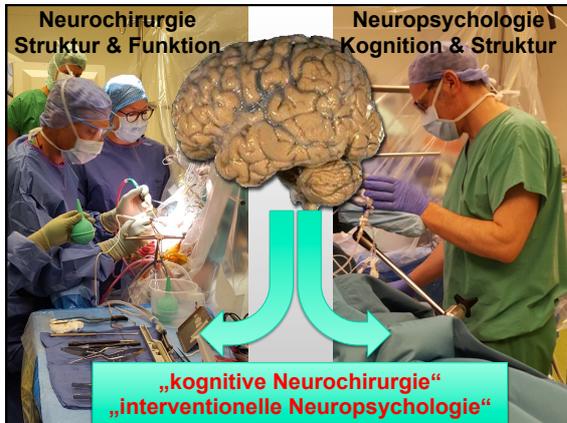
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Warum Präzision wichtig ist...

Personalisierte Medizin...

*Mit einem gezielten Schuss aus seiner Armbrust traf der Ur-Schweizer Wilhelm Tell den Apfel auf dem Kopf seines Sohnes.*

*Mit einem zweiten Pfeil traf er später transthorakal via Perikard den linken Ventrikel des bösartigen Landvogtes Gessler, was zur Gründung der unabhängigen Schweiz beitrug...*

M. Fey, Bern

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