PUSAT STUDI
BIOETIK DAN
HUKUM KEDOKTERAN ISLAM

Disponsori oleh:
UpToDate

Metode Intervensi Intra Arterial Heparin Flushing (IAHF):

Tinjauan Medis, Etis, Sosiologis, Politis, Bioetik Islam dan Hukum

SABTU
23 April 2022
07.00 - 12.00 WIB
via zoom

Intra Arterial Heparin Flushing (IAHF) dari tinjauan neurosains

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Irawan satriotomo M.D.,Ph.D.

Prepared for IAHF seminar FKUII April, 2022

Heparinized saline flushing does not improve the function of arterial lines !

Randomized Controlled Trial > Crit Care Resusc. 2006 Sep;8(3):205-8.

Comparison of normal or heparinised saline flushing on function of arterial lines

Rob K S Whitta [1], Kelly F M Hall, Trish M Bennetts, Lorraine Welman, Peter Rawlins

Affiliations + expand

PMID: 16930104

Abstract

Background: Heparin is used as a flush solution for intravenous and intra-arterial lines, but has a number of drug interactions, as well as potentially serious side effects.

Methods: We compared the function of arterial lines for both monitoring and blood sampling when flushed with either normal saline or saline containing heparin (1 unit/mL). Sixty-five patients were recruited at this mixed medical and surgical Level 2 intensive care unit. Patients were randomised to receive either normal saline (NS) or heparinised saline (HS) (3 mL/hour as a continuous flush). Each patient's nurse was asked to score the function of the line at the end of each nursing shift.

Results: 35 patients were recruited in the NS group and 30 in the HS group. Mean study duration was 5.8 and 6.6 days for the NS and HS groups, respectively. The scores for the intravascular line for each patient were summed, and the percentage of the total possible score was calculated. Mean percentage scores were 83% (NS group) and 82% (HS group). Comparison using the central limit theorem showed no difference between the groups at the 95% confidence interval (-6% to 10%).

Conclusions: Heparin as a continuous flush at 3 units/hour does not improve the function of arterial lines compared with a continuous normal-saline flush.

Similar articles

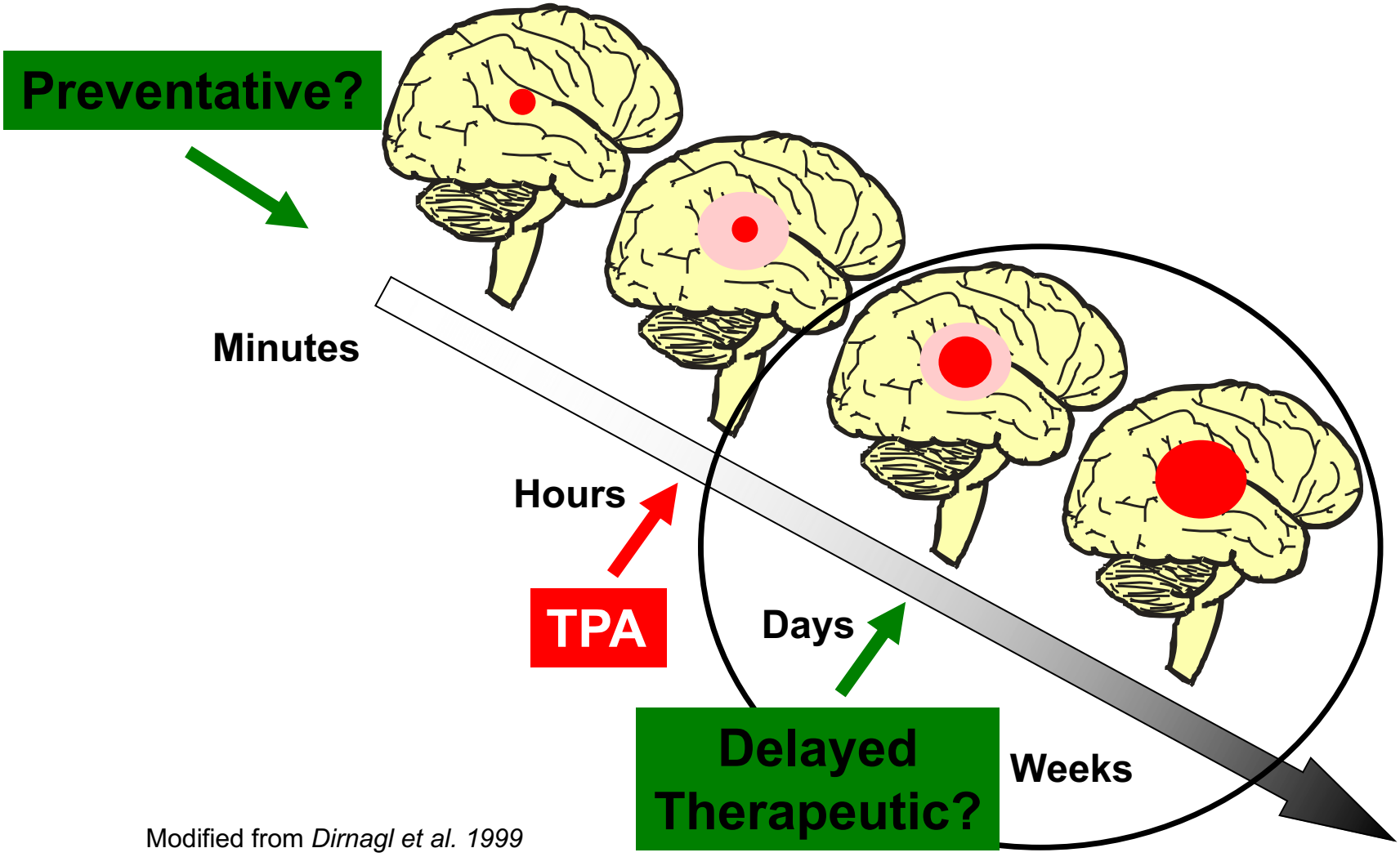
Effect of heparin in arterial line flushing solutions on platelet count: a randomised double-blind study.

Hall KF, Bennetts TM, Whitta RK, Welman L, Rawlins P.

Crit Care Resusc. 2006 Dec;8(4):294-6.

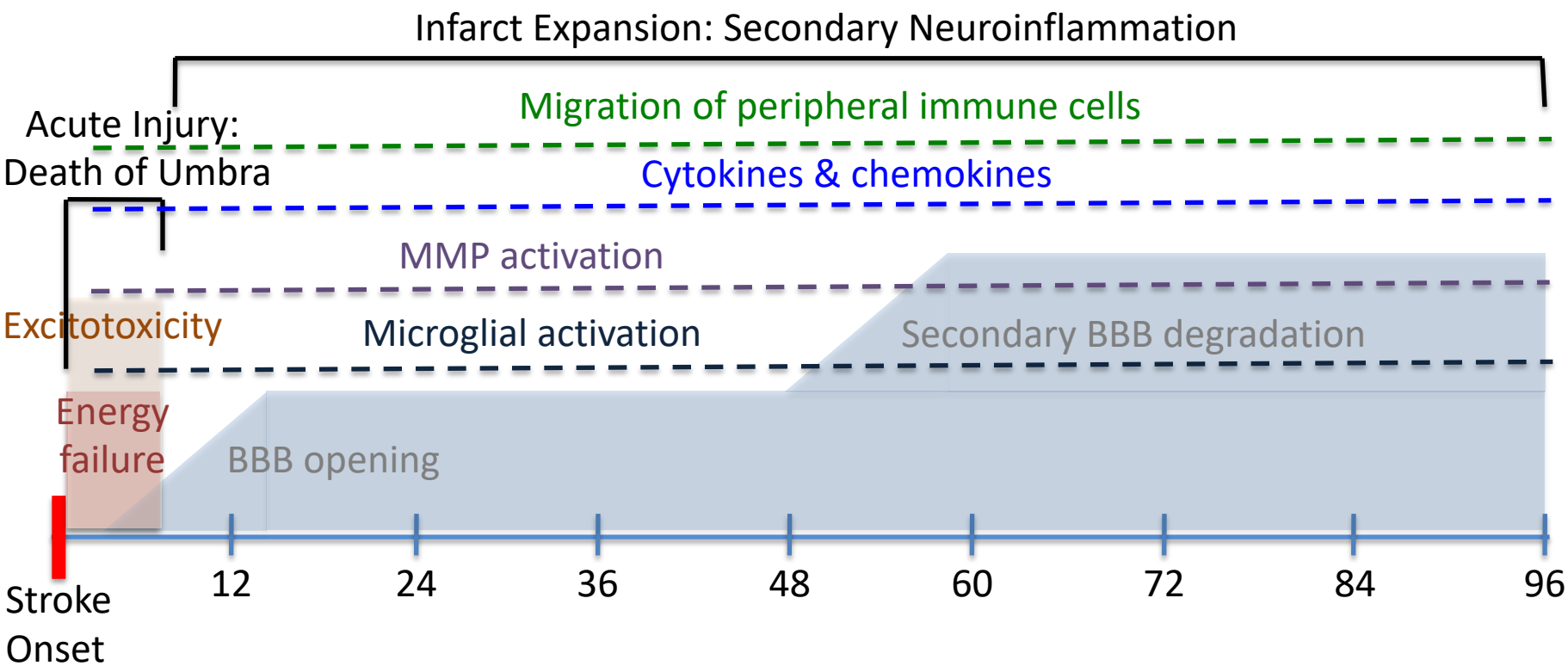
PMID: 17227264 Clinical Trial

Infarct Progression after Stroke



Modified from *Dirnagl et al. 1999*

Complexity of Stroke Injury Progression



How can we improve animal models to predict clinical efficacy of novel therapeutics?

Evidence Based Medicine (EBM) and Randomized Clinical Trial (RCT)

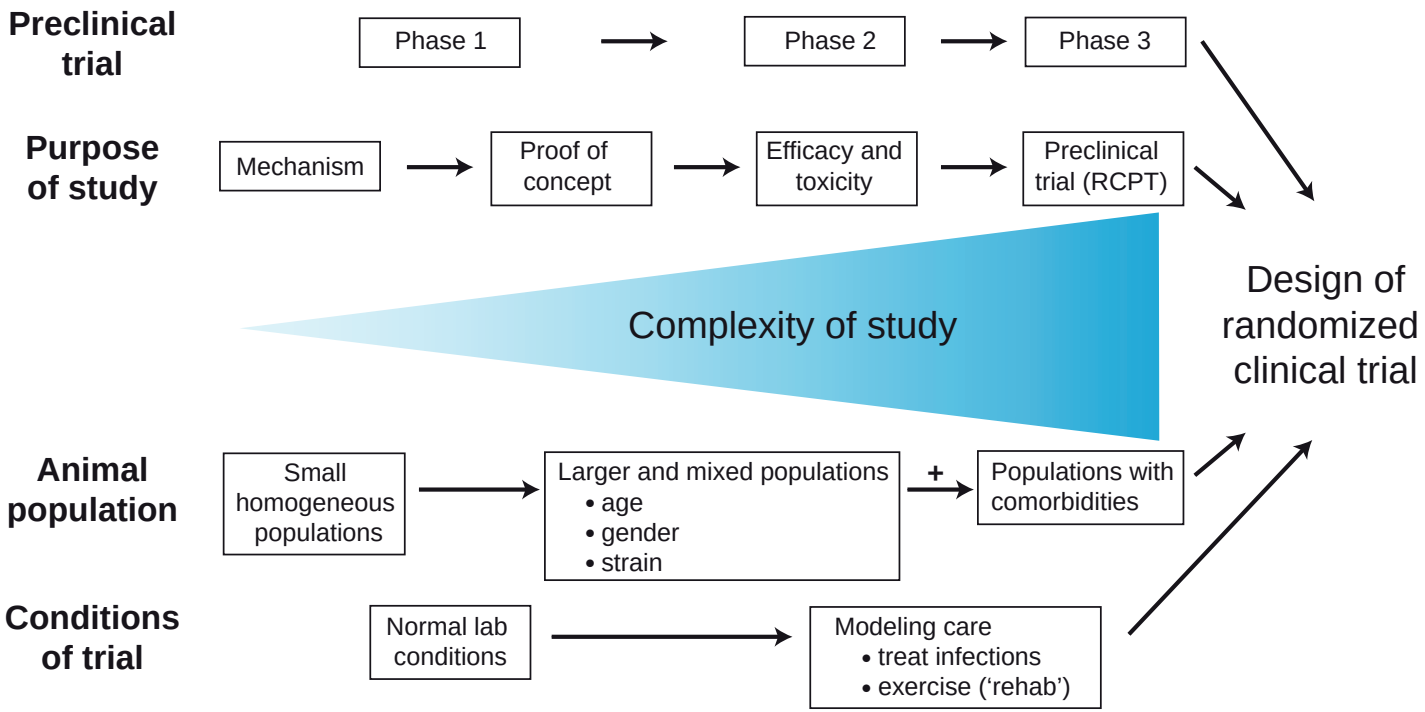


Fig. 2. The preclinical trial phases of translational stroke research. As therapeutic agents or concepts advance in development, the experimental setting increases in complexity. It ranges from small cohorts to investigate novel (pathophysiological) mechanisms to large mixed populations with (multiple) comorbidities and additional modeling of stroke care. The final stage of preclinical development is to conduct a randomized controlled preclinical trial (RCPT), ideally in a stroke unit setting. Randomized clinical trials commence after this process has been completed, and are based on evidence gained in preclinical testing.

American Heart Association | American Stroke Association

"Size of Treatment Effect"

"Estimate of Certainty (Precision) of Treatment Effect"

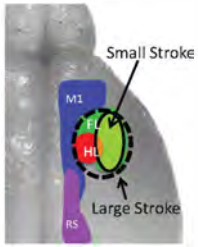
	Class I *Benefit >>> Risk* Procedure/Treatment SHOULD be performed/administered	Class IIa *Benefit >> Risk* *Additional studies with focused objectives needed* IT IS REASONABLE to perform procedure/administer treatment	Class IIb *Benefit ≥ Risk* *Additional studies with broad objectives needed; Additional registry data would be helpful* Procedure/Treatment MAY BE CONSIDERED	Class III *Risk ≥ Benefit* *No additional studies needed* Procedure/Treatment should NOT be performed/administered SINCE IT IS NOT HELPFUL AND MAY BE HARMFUL
Level A *Multiple (3-5) population risk strata evaluated** *General consistency of direction and magnitude of effect*	• Recommendation that procedure or treatment is useful/effective • Sufficient evidence from multiple randomized trials or meta-analyses	• Recommendation in favor of treatment or procedure being useful/effective • Some conflicting evidence from multiple randomized trials or meta-analyses	• Recommendation's usefulness/efficacy less well established • Greater conflicting evidence from multiple randomized trials or meta-analyses	• Recommendation that procedure or treatment not useful/effective and may be harmful • Sufficient evidence from multiple randomized trials or meta-analyses
Level B *Limited (2-3) population risk strata evaluated**	• Recommendation that procedure or treatment is useful/effective • Limited evidence from single randomized trial or non-randomized studies	• Recommendation in favor of treatment or procedure being useful/ effective • Some conflicting evidence from single randomized trial or non-randomized studies	• Recommendation's usefulness/efficacy less well established • Greater conflicting evidence from single randomized trial or non-randomized studies	• Recommendation that procedure or treatment not useful/effective and may be harmful • Limited evidence from single randomized trial or non-randomized studies
Level C *Very limited (1-2) population risk strata evaluated**	• Recommendation that procedure or treatment is useful/effective • Only expert opinion, case studies, or standard-of-care	• Recommendation in favor of treatment or procedure being useful/ effective • Only diverging expert opinion, case studies, or standard-of-care	• Recommendation's usefulness/efficacy less well established • Only diverging expert opinion, case studies, or standard-of-care	• Recommendation that procedure or treatment not useful/effective and may be harmful • Only expert opinion, case studies, or standard-of-care
Suggested phrases for writing recommendations †	should is recommended is indicated is useful/effective/beneficial	is reasonable can be useful/effective/ beneficial is probably recommended or indicated	may/might be considered may/might be reasonable usefulness/effectiveness is unknown /unclear/uncertain or not well established	is not recommended is not indicated should not is not useful/effective/beneficial may be harmful

*Data available from clinical trials or registries about the usefulness/efficacy in different sub-populations, such as gender, age, history of diabetes, history of prior MI, history of heart failure, and prior aspirin use. A recommendation with Level of Evidence B or C does not imply that the recommendation is weak. Many important clinical questions addressed in the guidelines do not lend themselves to clinical trials. Even though randomized trials are not available, there may be a very clear clinical consensus that a particular test or therapy is useful or effective.

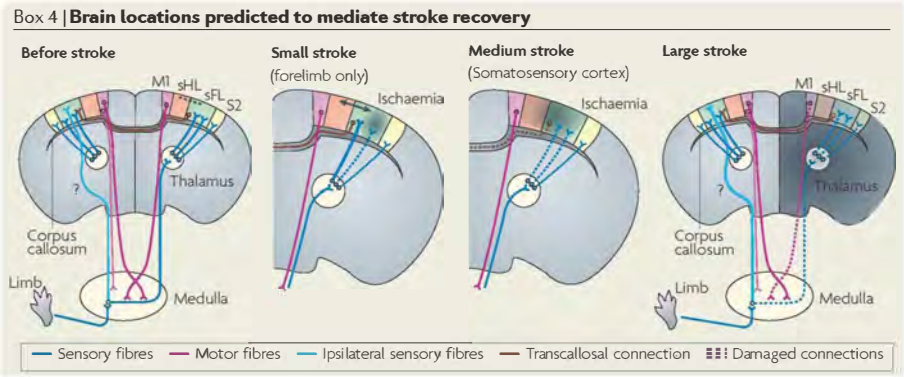
†In 2003, the ACC/AHA Task Force on Practice Guidelines developed a list of suggested phrases to use when writing recommendations. All recommendations in this guideline have been written in full sentences that express a complete thought, such that a recommendation, even if separated and presented apart from the rest of the document (including headings above sets of recommendations), would still convey the full intent of the recommendation. It is hoped that this will increase readers' comprehension of the guidelines and will allow queries at the individual recommendation level.

Figure. Applying classification of recommendations and level of evidence.

Neuroplasticity post-stroke

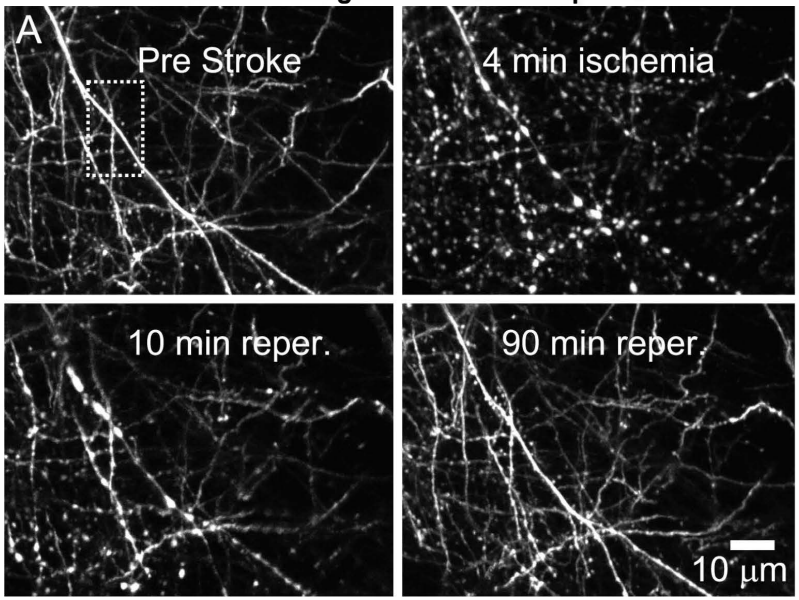


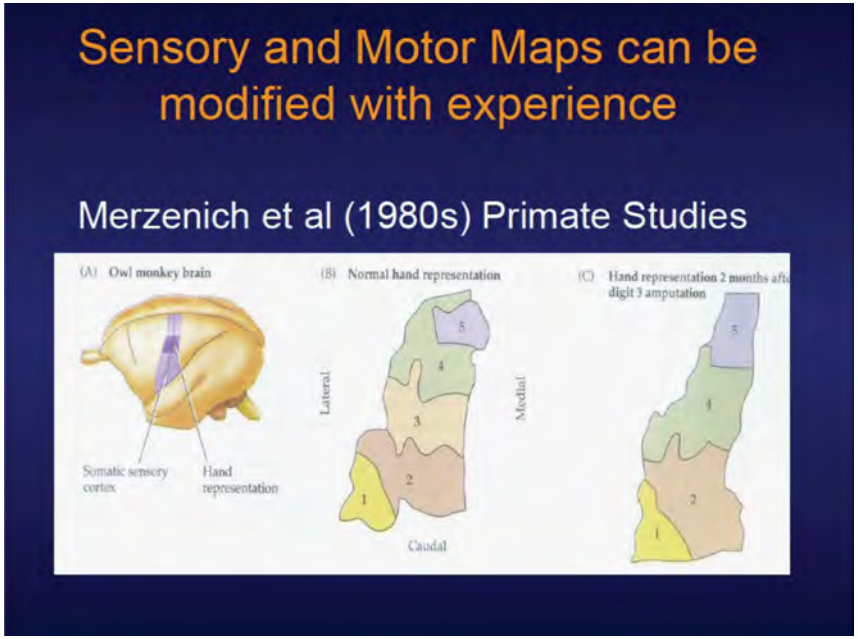
Large strokes may recruit ipsilateral pathways during recovery.



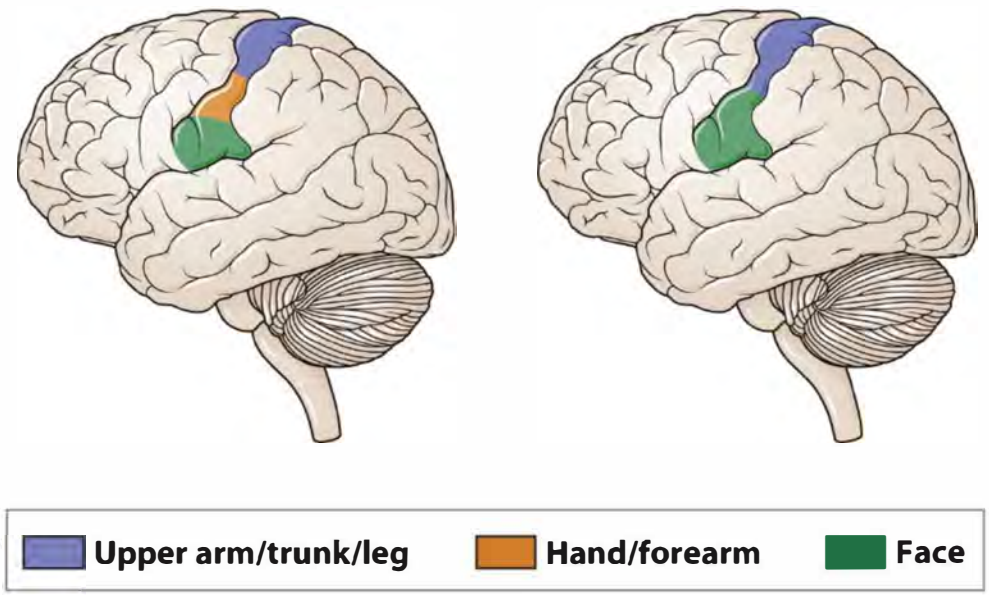
Murphy and Corbett Nat. Rev. Neurosci. 2009

Dendrites during ischemia and reperfusion.





Normal somatosensory cortex **Amputee somatosensory cortex**



How we know that those are bad science (pseudoscience)?

SPOTTING BAD SCIENCE

Being able to evaluate the evidence behind a scientific claim is important. Being able to recognise bad science reporting, or faults in scientific studies, is equally important. These 12 points will help you separate the science from the pseudoscience.

1. SENSATIONALISED HEADLINES

Article headlines are commonly designed to entice viewers into clicking on and reading the article. At times, they can over-simplify the findings of scientific research. At worst, they sensationalise and misrepresent them.

2. MISINTERPRETED RESULTS

News articles can distort or misinterpret the findings of research for the sake of a good story, whether intentionally or otherwise. If possible, try to read the original research, rather than relying on the article based on it for information.

3. CONFLICTS OF INTEREST

Many companies will employ scientists to carry out and publish research - whilst this doesn't necessarily invalidate the research, it should be analysed with this in mind. Research can also be misrepresented for personal or financial gain.

4. CORRELATION & CAUSATION

Be wary of any confusion of correlation and causation. A correlation between variables doesn't always mean one causes the other. Global warming increased since the 1800s, and pirate numbers decreased, but lack of pirates doesn't cause global warming.

5. UNSUPPORTED CONCLUSIONS

Speculation can often help to drive science forward. However, studies should be clear on the facts their study proves, and which conclusions are as yet unsupported ones. A statement framed by speculative language may require further evidence to confirm.

6. PROBLEMS WITH SAMPLE SIZE

In trials, the smaller a sample size, the lower the confidence in the results from that sample. Conclusions drawn can still be valid, and in some cases small samples are unavoidable, but larger samples often give more representative results.

7. UNREPRESENTATIVE SAMPLES USED

In human trials, subjects are selected that are representative of a larger population. If the sample is different from the population as a whole, then the conclusions from the trial may be biased towards a particular outcome.

8. NO CONTROL GROUP USED

In clinical trials, results from test subjects should be compared to a 'control group' not given the substance being tested. Groups should also be allocated randomly. In general experiments, a control test should be used where all variables are controlled.

9. NO BLIND TESTING USED

To try and prevent bias, subjects should not know if they are in the test or the control group. In 'double blind' testing, even researchers don't know which group subjects are in until after testing. Note, blind testing isn't always feasible, or ethical.

10. SELECTIVE REPORTING OF DATA

Also known as 'cherry picking', this involves selecting data from results which supports the conclusion of the research, whilst ignoring those that do not. If a research paper draws conclusions from a selection of its results, not all, it may be guilty of this.

11. UNREPLICABLE RESULTS

Results should be replicable by independent research, and tested over a wide range of conditions (where possible) to ensure they are consistent. Extraordinary claims require extraordinary evidence - that is, much more than one independent study!

12. NON-PEER REVIEWED MATERIAL

Peer review is an important part of the scientific process. Other scientists appraise and critique studies, before publication in a journal. Research that has not gone through this process is not as reputable, and may be flawed.

Ignorance and stupidity are expensive, and you will pay the higher for it!