Background and Purpose—Controversy regarding the risks and benefits of thrombolysis has not been helped by the perception that some trials were “positive” and others “negative” on their primary outcome measure of either “good” or “poor” functional outcome. We wondered whether the definition of good or poor functional outcome might have contributed to this perception, and what effect altering the definition might have on the individual trials and on the systematic review of all the trials combined.

Methods—We analyzed data on functional outcome, extracted from the randomized trials of thrombolysis in acute ischemic stroke, according to good (modified Rankin scale scores of 0 to 1 versus 2 to 6) and poor (modified Rankin 0 to 2 versus 3 to 6) functional outcome, to determine the effects of thrombolysis.

Results—Twelve trials (4342 patients, treated up to 6 hours after stroke) contributed to this analysis. Overall, there was no difference in the estimate of treatment effect between the 2 definitions (modified Rankin 0 to 2 versus 3 to 6, and 0 to 1 versus 2 to 6 [ORs 0.83 and 0.79, respectively]). However, the apparent “success” of several individual trials did alter.

Conclusions—We should not place undue emphasis on the results of individual trials, when a change of a single point on the Rankin scale can make the difference between “success” and “failure.” Overall, by either analysis, there was a significant benefit in patients treated with thrombolysis up to 6 hours after stroke. (Stroke. 2000;31:1133-1135.)

Key Words: cerebral infarction ■ meta-analysis ■ stroke, acute ■ thrombolytic therapy ■ treatment outcome
Meta-analysis of all completed randomized controlled trials of thrombolytic therapy in acute ischemic stroke. Individual trials are listed on the left, with plots of poor functional outcome (modified Rankin scale scores of 3 to 6 and 2 to 6) on the right.

The interpretation of these data are a matter for debate and personal opinion, but failure to recognize the play of chance in trials with small sample sizes, or the fact that there appears to be overall benefit, could result in patients being denied effective treatments through lack of a license. Although rtPA is licensed in the United States and Canada, it is only for patients who can be treated within 3 hours of stroke and who meet fairly stringent criteria (as yet, there is no European license). The uptake of rtPA in the United States since licensing has been disappointing. Yet the data suggest that the benefit is large and extends beyond 3 hours. Granting a license on the present evidence (granting it at all in Europe or extending it beyond 3 hours in the United States) might increase patient access to this treatment. However, the dilemma for the individual clinicians, managers, family doctors, public health doctors, and health services is that the size of the benefit and the types of patients most likely to benefit need further definition. In particular, the existing trials provide little data on thrombolysis in elderly patients or those with CT infarct signs, when to start aspirin, the effect of stroke severity, and the time window beyond which there is unlikely to be any benefit. The latest time window may depend on individual patient characteristics, perhaps detectable by brain imaging, rather than an arbitrary value of 3 or 6 hours for all patients. These issues should be addressed in further trials, which in the case of thrombolysis need to be much larger (ie, approximately 6000 patients) to provide a more precise estimate of the treatment effect and clearer definition of which patients are most likely to benefit. This information will certainly be required to convince healthcare providers that the benefit of thrombolysis is worth its risk, the expense, and the work involved in restructuring acute stroke services to enable the safe delivery of thrombolysis.
References

Trials of Thrombolysis in Acute Ischemic Stroke: Does the Choice of Primary Outcome Measure Really Matter?

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