

## Introducing Medicine by the Numbers: A Collaboration of The NNT Group and AFP

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Wouldn't it be nice if every intervention improved a patient's outcome? Obviously, that's not the way it works. It is surprising how seldom some interventions help—for example, lipid-lowering drugs. Hundreds of low-risk patients might need to be treated with statins for years before one is helped, and even this small benefit presumes we believe the best-case scenario that randomized trials tend to represent. Also, this does not take into account any patients that may be harmed through adverse events. Why is the margin of benefit often so small? Why don't common interventions work better? Among the reasons: (1) Many people will never have a bad outcome, regardless of risk (which makes it impossible to prevent one). Many with high cholesterol, for example, will never have a heart attack, stroke, or cardiovascular death, with or without intervention. Giving lipid-lowering drugs to those people does not achieve—indeed can't achieve—their intended beneficial effect. (2) For some people, the treatment simply does not work; some with hyperlipidemia will have a heart attack despite lipid-lowering therapy.

There are various ways of quantifying risks and benefits of therapy, including relative risk reduction (RRR), absolute risk reduction (ARR), and number needed to treat (NNT). Each has its advantages and disadvantages. Consider the following scenario: In a randomized trial, 10% of patients receiving drug X have a heart attack, compared with 20% in the placebo group. Note that this means that at least 80% of people weren't going to have a heart attack regardless of which group they were assigned to. However, drug X lowered overall risk from 20% to 10%, for an RRR of 50% (20 minus

10, divided by 20). The ARR—a better measure of treatment effect—was 10% (20 minus 10).

RRR tends to overemphasize the benefit. If the initial risk were, say, 0.2% and drug X lowered this to 0.1%, the RRR would still be 50%, but the ARR would be only 0.1%, which is not much of a difference from baseline. To help convey the ARR and the strength of an intervention in more practical terms, the concept of NNT was developed. The NNT is the number of people on average who would need to receive an intervention instead of the alternative for one patient to benefit.<sup>1</sup> The NNT is a reflection of the ARR and is calculated as 1 divided by the ARR. In the earlier example, the ARR is 10%, so the NNT =  $1/10\% = 1/0.1 = 100/10 = 10$ .

The lower the NNT, the better. Interventions with an NNT in the single or low double digits are generally considered effective, and depending on the significance of the outcome (such as preventing death), an NNT in the lower hundreds may also be considered useful. *American Family Physician* includes NNT values in our articles to help readers gauge the relative benefits of various interventions. However, we realize that the concept of NNT is not always readily understood or embraced; patients and physicians tend to respond more to effects presented in the potentially misleading RRR or in other measures, such as years of potential life gained.<sup>2,3</sup> Some experts advise not to use NNT when counseling patients about risk reduction. Instead, they advise using visual aids,<sup>4</sup> such as those that have been used for deciding whether to take statins to reduce cardiovascular risk or for deciding on options for breast cancer treatment.<sup>5</sup>

For our physician readers, we think the NNT is a useful concept that helps convey the importance of an intervention in various populations. The NNT assigns a bottom-line number to the relative strength of an intervention, and helps put it in perspective. Toward that end, we are happy to announce a partnership with TheNNT.com, an online

medical reference developed by Drs. David H. Newman and Graham Walker in 2010 (<http://www.thennt.com/>). TheNNT.com team reviews and synthesizes the evidence on treatment, diagnosis, and risk assessment for dozens of major clinical conditions and interventions. For each intervention, they highlight the benefits and harms using the NNT for benefit, and the analogous number needed to harm (NNH) to indicate the number of people who need to receive a treatment before one experiences a certain harmful effect. In addition, they use a color-coded rating system to convey an overall judgment about the intervention:

**Green:** Benefits are judged to be greater than the potential harms

**Yellow:** Benefits are unclear

**Red:** No benefits, but also no significant harms

**Black:** Harms exceed the benefits

As with any assessment of risk and benefit, deciding on what's a favorable threshold is a judgment call. Although not everyone may agree with an assigned color code, the NNTs and NNHs will help clinicians making judgment calls on selected interventions for individual patients.

This new series will appear in the online-only edition of *AFP*. Each month, medical editors from *AFP* and TheNNT.com will select a topic to feature. We will use TheNNT.com's color-coding to quickly convey the relative merits of an intervention, and present the numbers for benefit and harm in a summary box. A discussion outlines the background evidence and the rationale for the rating, accompanied by key supporting references.

This series marks a new expansion of *AFP* content in our online edition, where we are able to provide more resources for our readers than we can in the limited space of the print edition. We hope you like this new feature and encourage you to explore additional content on TheNNT.com's website. Please let us know what you think about our new feature, whether you find NNTs helpful, and whether you have any suggestions for improving the ways we provide information to help in the care of your patients.

**EDITOR'S NOTE:** Dr. Siwek is editor of *AFP*.

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