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Reply

We thank Dr. Grundtvig and colleagues for their interest in our paper (1). They have concerns regarding: 1) the mortality figures; 2) achieved drug prescription; and 3) use of diuretics in the BATTLESCARRED (NT-proBNP-Assisted Treatment To Lessen Serial Cardiac Readmissions and Death) trial (1) of hormone-guided treatment of heart failure.

1. They assert incorrect mortality figures, having misread Table 4 (1), which documents composite end points not deaths. One-year mortality was 18.9% (23 deaths) in the usual care group and 9.1% (11 deaths) in both intensively followed groups, not 16, 6, and 7 deaths, as asserted by Dr. Grundtvig and colleagues. Similarly, 3-year mortality in those under 75 years of age was 15.5% (9 deaths) in the hormone-guided subgroup and 30.9% (17 deaths) and 31.3% (20 deaths) in the other 2 groups, not 6, 6, and 12 deaths as Grundtvig and colleagues write. The correct figures are stated in the Results section and are illustrated with tabled numbers in Figure 2 (1).
2. That the prescription of angiotensin-converting enzyme inhibitor/angiotensin receptor blocker, beta-blockade, and spironolactone was somewhat higher in the Norwegian Heart Failure Registry than in BATTLESCARRED is of interest and may reflect the younger age of registry subjects (71 years) compared with trial patients (median age: 75 to 76 years). As stated in the Methods section (1), the trial design mandated prescription of drugs to trial-based levels or intolerance in both intensively followed groups, and this principle was followed scrupulously. Intolerable side effects (commonly hypotension or azotemia) were more frequent in those over 75 years of age. Nevertheless, the proportions of patients receiving evidence-based drugs, and doses achieved, were similar to those seen in previous trials and reflect "real-life" limitations on dose escalation in this fragile group of patients. In addition, our patients all had to have clearly elevated N-terminal pro–B-type natriuretic peptide levels as an inclusion criterion, which is likely to have selected a more fragile population (more prone to drug intolerance) than those in the Norwegian registry.
3. We do not claim that our results mandate escalation of diuretic doses in the presence of persistently elevated N-terminal pro–B-type natriuretic peptide levels. In fact, final diuretic doses were similar in both intensively managed groups (Table 3 of our study [1]), although they were more frequently adjusted (both up and down) in the hormone-guided group. However, it is clear that patients under 75 years of age were frequently able to tolerate increased doses of diuretics without hypotension or azotemia, and in the case of the hormone-guided group, this occurred together with improved 3-year survival. We make no claim that higher diuretic dose directly improved mortality. The fact that diuretic dose is associated with increased mortality in the Norwegian registry is no surprise given that decompensation is the prime trigger for increasing doses. However, such an association in no way indicates that diuretics cannot be appropriately and beneficially increased in addition to neurohormonal blockade provided proper clinical surveillance (to avoid hypotension, azotemia, and other problems) is sustained.

Finally, we agree that any shift in clinical management requires good evidence and suggest that this is now accumulating with 4 randomized controlled trials consistently suggesting that at least younger (age <75 years) patients with heart failure may benefit from consideration of serial B-type peptide levels in monitoring and adjusting treatment.

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Practical Considerations for 1-Day Stress-Only Myocardial Perfusion Protocol

Chang et al. (1) explore the advantages of technetium (Tc-99m) sestamibi and Tc-99m tetrafosmin 1-day stress-only perfusion imaging. This is an invaluable protocol in cardiac nuclear stress testing, especially in light of the growing concern surrounding radiation exposure secondary to physician-ordered imaging tests (2). Additionally, as the investigators mention, it decreases overall cost, decreases radiopharmaceutical doses, and takes less time for the patient in comparison to a study that also requires rest imaging (1).

Chang et al. (1) argue that the 1-day stress/rest Tc-99m protocol is preferable, because of the option to forego rest images when stress perfusion scans are normal. It is notable, however, that when this protocol requires rest images, there is a longer wait time between images secondary to higher tracer uptake during the low stress image when compared with the wait time between images in a 1-day rest/stress Tc-99m protocol (3).

Their report (1) states that stress imaging should be followed by rest imaging "only in patients with equivocal or clearly abnormal