Liesnard suggests a different and more expensive strategy than vaccination of persons with isolated anti-HBc, which would involve multiple serologic tests for HBV markers, alanine aminotransferase (ALT), and testing for HBV DNA. Liesnard bases this strategy on the possibility that HBV DNA is demonstrated in a minority of persons with isolated anti-HBc and also on the concern that hepatitis B vaccine in persons who are HBV DNA positive could induce the emergence of surface antigen escape mutants. These mutants have been previously described primarily in infants of HBs antigen–positive mothers who are given both hepatitis B immunoglobulin (HBIG) and hepatitis B vaccine, and are thought to be selected for primarily by HBIG and not by vaccine [3]. These mutants should be detected by use of PCR using primers from the core region, since the mutations are only in the surface gene. Because we found HBV DNA in only 4% of our study population and we used primers from the core region as well as the surface region, it is highly unlikely that a significant proportion of our population of anti-HBc positive persons is infected with these surface gene mutant HBV viruses. Furthermore, we do not advocate the administration of HBIG to adults with anti-HBc only. Therefore, we stand by our proposed strategy to vaccinate persons with anti-HBc only.

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Native Valve Infective Endocarditis in Elderly and Younger Adult Patients: Comparison of Clinical Features and Outcomes with Use of the Duke Criteria

SIR—We read with interest the article by Gagliardi et al. [1], comparing clinical features and mortality in 108 elderly and younger patients with native valve infective endocarditis, defined by the Duke criteria [2], and no history of intravenous drug abuse.

Because we have applied the same evaluation criteria to our database of patients with infective endocarditis, we would like to report our findings on 155 patients with native valve infective endocarditis (Duke criteria) and no history of intravenous drug abuse, who have been hospitalized in our tertiary-care institution between 1980 and 1995. We excluded all patients who were 60–64 years of age to detect age-related differences in two distinct groups of patients. Of the remaining 135 patients, 82 could be assigned to the group of younger patients (17–59 years of age) and 53 to the group of elderly patients (65–90 years of age). In a systematic retrospective chart review, we analyzed multiple demographic, clinical, echocardiographic, and treatment-related parameters to evaluate age-related differences in clinical presentation and factors associated with outcome.

Similar to the results reported by Gagliardi et al., renal insufficiency at admission and malignancy were significantly more common among elderly patients (table 1). In addition, there was no significant difference between the two groups relative to comorbidities such as diabetes mellitus and immunosuppression, frequency

Table 1. Comparison of comorbidities among 53 elderly and 82 younger adult patients with infective endocarditis.

Condition	No. (%) of patients: Elderly patients (n = 53)	Younger patients (n = 82)	P value
Cardiac risk factors	22 (42)	49 (60)	<.04
Bicuspid aortic valve	1 (2)	10 (12)	<.02
Congenital vitium	0 (0)	7 (9)	<.03
Diabetes mellitus	7 (13)	12 (15)	NS
Renal insufficiency on admission	19 (36)	12 (15)	<.005
Malignancy	12 (23)	6 (7)	<.02
Immunosuppression	0 (0)	3 (4)	NS

Table 2. Comparison of complications and outcomes among 53 elderly and 82 younger adult patients with infective endocarditis.

Complication or outcome	No. (%) of patients: Elderly patients (n = 53)	Younger patients (n = 82)	P value
Fever	50 (94)	76 (93)	NS
Neurological symptoms	23 (43)	28 (34)	NS
Splenomegaly	10 (19)	33 (40)	<.01
Heart failure	27 (51)	31 (38)	NS
Valvular surgery	16 (30)	33 (40)	NS
ECC duration (min)	101	91	NS
Post-interventional complications	14 (88)	14 (42)	<.003
Arrhythmias	12 (75)	13 (39)	<.02
Necessity of reoperation	7 (64)	3 (23)	<.05
Embolic events	24 (45)	46 (56)	NS
Anticoagulant therapy	32 (60)	39 (48)	NS
Cerebral deficit on discharge	2 (5)	6 (8)	NS
Death	13 (25)	9 (11)	<.04

NOTE. ECC = extra-corporeal circulation.

Table 3. Age-controlled predictors of mortality among patients with infective endocarditis: logistic regression analysis of in-hospital complications and predictors of death.

Complication	OR	95% CI	*P* value
Cardiac risk factors	0.6	0.3–1.1	.47
Renal insufficiency	1.8	0.5–7.2	.39
CNS infection	2.5	0.4–14.0	.31
Age	1.0	0.6–6.1	.30
Pulmonary embolism	6.2	0.4–151.8	.23
Intracranial hemorrhage	7.9	0.5–126.9	.15
Number of symptoms on first doctor visit	0.8	0.5–1.0	.10
Surgery	0.3	0.1–1.1	.08
Neurological symptoms	7.4	2.1–30.5	.0038

of fever, heart failure, embolic events, neurological symptoms and valvular surgery, distribution of causative organisms, and cerebral deficit at the time of discharge (tables 1 and 2). Further, we found no significant differences between the two groups with respect to additional factors, such as duration of eventual valve surgery, frequency of anticoagulation therapy, and latency of diagnosis (table 2).

In contrast to the patients studied by Gagliardi et al., the duration of hospitalization was not greater in our group of elderly patients than in younger patients (mean, 35 vs. 36 days). However, for several factors not reported by Gagliardi et al. we found significant differences between the two age groups. Older patients were significantly more prone to complications after valvular surgery in general (i.e., prosthetic dysfunction, pericardial tamponade, and renal insufficiency), and, particularly, rhythm disturbances, as well as the necessity for a second intervention (table 2). For younger patients, known cardiac comorbidities were significantly more common, especially bicuspid aortic valve and congenital vitia in general (table 1). The same was true for the frequency of vascular phenomena at admission and splenomegaly (table 2). Sites of valvular involvement were significantly different in the two age groups. While in the elderly the mitral valve was predominantly affected (52%), the aortic valve was the site of infection for 55% of younger patients ($P < .006$).

In-hospital mortality was higher in the elderly and in patients with renal insufficiency according to univariate analysis, but this difference was no longer significant after logistic regression analysis had been performed (table 3). The only independent risk factor for adverse outcome was neurological deficit during infective endocarditis.

As expected, and in accordance with the report by Gagliardi et al., we found no relevant differences in symptoms and signs of infective endocarditis in the two age groups and a predominance of comorbidities in elderly patients. However, the distribution of affected valves was significantly different between the two groups. We can confirm the finding by Gagliardi et al. that age is not an independent predictor of adverse outcome, while neurological deficit is. Although this finding supports early and aggressive treatment of native valve infective endocarditis in elderly patients, our analysis adds an element of caution with respect to valve replacement surgery, as the procedure is prone to more frequent complications in this patient group.

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Reply

SIR—We agree that the results reported by Netzer et al. are basically similar to the data we reported concerning the presentation, clinical course, and outcome of infective endocarditis (IE) in younger and elderly patients with native valve endocarditis [1]. However, a few differences between their results and ours are notable. Netzer et al. found that splenomegaly occurred in a higher proportion of their younger patients with IE. The presence or absence of splenomegaly was not recorded for all of the patients included in our analysis; therefore, we were unable to compare our data on this potentially important finding with theirs.

Some differences between our results and those of Netzer et al. may reflect differences in patient selection. Our study arbitrarily defined patients aged 30–59 years as a ''younger adult group'' [1]; Netzer et al. included patients aged 17–59 years in their younger adult cohort. Twenty-one percent of the younger patients reported by Netzer et al. had congenital valvular abnormalities, including 12% with bicuspid aortic valves. We found no statistically significant differences in location of valvular involvement between younger and elderly adult patients [1].

Netzer et al. reported that elderly patients were at greater risk for postoperative complications. This finding is both important and consistent with our general clinical experience and common sense, but we did not specifically examine this point in our study because our original database did not include follow-up information for all patients [1].

Since 1996, we have prospectively collected data from all patients suspected of having IE at Duke University Medical Center (Durham, North Carolina). Follow-up information was