OBJECTIVE: To determine the appropriate needle length for intramuscular injection of vaccines to early adolescents by measuring muscle depth at the deltoid injection site.

METHODS: Students from Nassau County, New York, and patients attending an adolescent clinic were invited to participate. Height, weight, and arm circumference were measured. BMI percentiles were obtained. Depths of muscle and bone underlying the deltoid injection site were measured by using ultrasonography while the deltoid area was bunched or flattened. A sufficiently long needle length was defined as greater than or equal to the skin-to-muscle depth plus 5 mm (based on measurement, no needle used). Too long was considered greater than or equal to skin-to-bone depth.

RESULTS: The age range of the 141 subjects was 11 to 15 years. Fifty-five percent were female. Twenty-six percent weighed <40 kg, and 20% were between 60 and 108 kg. The mean and median BMI percentiles were 58th and 62th, respectively, with 6% of the subjects at <10th percentile and 28% of subjects at >85th percentile. Using the bunch technique, we found that a 25-mm (1-in) needle is acceptable in 86% of subjects; in the subgroup of 60 kg, it is acceptable in 100% of subjects. A 16-mm (-in) needle is acceptable in 88%; in the
A subgroup of <60 kg, it is acceptable in 98% of subjects. Using the flatten technique, a 25-mm needle is acceptable in 39%; in the subgroup of 60 kg, it is acceptable in 93% of subjects. A 16-mm needle is acceptable in 92%; in the subgroup of <60 kg, it is acceptable in 96% of subjects.

CONCLUSIONS: For intramuscular immunization of early adolescents, a 16-mm needle is appropriate for those weighing <60 kg, and a 25-mm needle is appropriate for those weighing 60 to 70 kg, using either technique.