1053-42-193 **David V. Cruz-Uribe*** (`david.cruzuribe@trincoll.edu`), Department of Mathematics, Trinity College, 300 Summit St., Hartford, CT 06106-3100, and **Jose Maria Martell** and **Carlos Perez**. *Sharp weighted estimates for the Hilbert transform, Riesz transforms, and the Beurling-Ahlfors operator.*

We give a new proof of the sharp weighted L^p inequality

$$\|Tf\|_{L^p(w)} \leq C(n,T)[w]_{A_p}^{\max\left(1,\frac{1}{p-1}\right)}\|f\|_{L^p(w)},$$

where T is the Hilbert transform, a Riesz transform, or the Beurling-Ahlfors operator. By the sharp form of the Rubio de Francia extrapolation theorem due to Dragičević *et al.*, it suffices to prove this inequality when $p = 2$. These inequalities were first proved by Petermichl and Volberg. Their proofs reduced the problem to proving the sharp L^2 estimates for certain dyadic Haar shift operators; these in turn were proved using Bellman function techniques. More recently, Lacey, Petermichl and Reguera-Rodriguez gave a unified proof that avoided Bellman functions and instead used a two-weight, $T1$ theorem for Haar shift operators due to Nazarov, Treil and Volberg. Our proof instead uses a remarkable new pointwise estimate due to Lerner that is based on the sharp local maximal function of Jawerth and Torchinsky. Our approach also yields sharp norm inequalities for dyadic paraproducts and other operators, and can also be used to get new two-weight inequalities with "A_p bump" conditions. (Received September 03, 2009)