most guidelines do not recommend it other than in the context of clinical trials or registries.

***Alternative Therapies*** Alternative therapies such as acupuncture and yoga have not been shown to improve asthma in controlled trials. Studies with placebo have demonstrated that there may be a significant response to placebo.

***Therapies in Development*** Trials are underway targeting pathways and receptors shown in Fig. 287-3. Those in more advanced stages of development include therapies targeting TSLP, IL-33, and $CRTH_2$. Studies targeting IL-17 and TNF-α have not shown efficacy, but it is unclear if they were appropriately targeted. Whether these interventions might prove useful for particular endotypes of asthma is unclear. Proof-of-concept studies targeting mast cells via inhibition of tyrosine kinase have suggested efficacy in severe asthma.

## APPROACH TO THE PATIENT

# Asthma

U.S. (National Asthma Education and Prevention Program [NAEPP]) and World Health Organization (Global Initiative for Asthma [GINA]) guidelines advise a symptomatic approach to asthma treatment assuming that appropriate measures have been taken to address asthma triggers, exposures, and comorbidities enumerated in Tables 287-2 and 287-3. Additionally, adherence and inhaler techniques need to be addressed. Poor adherence or poor inhaler technique has been identified as the cause of poor asthma control in up to 50% of patients referred for poorly controlled asthma.

The stepwise approach to intensifying and reducing asthma therapy is outlined in **Table 287-5**. It involves "stepping" therapy up or down based on assessment of whether asthma is controlled by the criteria listed in Table 287-4. Assuming comorbidities have been addressed, adherence has been evaluated, education regarding avoiding triggers has been performed, and inhaler