Epinephrine Concentrations in EpiPens After the Expiration Date

PURPOSE OF THE STUDY. To determine if EpiPens are still potent up to 50 months after the labeled expiration date.

STUDY POPULATION. Unused, expired EpiPens were collected from patients and practitioners at a community clinic.

METHODS. Patients and practitioners provided unused, expired EpiPens over a 2-week period. All units were examined for color changes and expiration date. The concentration of epinephrine in two aliquots from each unit was quantified by liquid chromatography and tandem mass spectrometry. Epinephrine-d6 was used as an internal standard.

RESULTS. Thirty-one expired EpiPen and 9 EpiPen Jr autoinjectors were analyzed. All medications were between 1 to 50 months past the labeled expiration date. None were discolored. Sixty-one percent (19 out of 31) of the EpiPen and 56% (5 out of 9) EpiPen Jr devices contained at least 90% of the stated amount of epinephrine. All the devices had at least 80% epinephrine remaining at the time of testing.

CONCLUSIONS. EpiPen and EpiPen Jr autoinjectors retain a majority (at least 80%) of the labeled quantity of epinephrine up to 50 months after the written expiration date.

REVIEWER COMMENTS. Although there appeared to be a trend for the concentration of epinephrine to slightly decrease over time in the devices tested, the authors of this study demonstrate that most of the drug is still present after several years. The limitations of this study include the small number of devices and the unknown number of lots analyzed, and the authors did not assess how the units were stored or handled before and after they were expired. Considering the recent controversy regarding the skyrocketing prices of prescribed self-injectable epinephrine devices, more attention among prescribers and patients has been directed toward the use of expired epinephrine, particularly when it is cost prohibitive or no other alternative is readily available in an emergency situation. Future studies should be focused on outcomes in cases in which expired epinephrine and the minimum dose content that would be needed to deliver a therapeutic effect are used. In the meantime, the authors suggest that, in the event of a severe allergic reaction, it would be more prudent to use an expired EpiPen rather than no EpiPen at all.

URL: www.pediatrics.org/cgi/doi/10.1542/peds.2017–2475FF

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DRUG ALLERGY

The High Impact of Penicillin Allergy Registration in Hospitalized Patients

PURPOSE OF THE STUDY. To assess the impact of a diagnosis of penicillin allergy in hospitalized patients.

STUDY POPULATION. The study included all patients (children and adults) admitted at the University Medical Center in Utrecht, the Netherlands, over a 1-year period who underwent a standardized pharmacotherapeutic interview. There were 997 patients with documentation of penicillin allergy (Pen-A) and 2939 patients without documentation of penicillin allergy (non–Pen-A).

METHODS. This was a prospective, matched cohort study. Patients were registered as having penicillin allergy if the history demonstrated either an evaluation by a specialist or general practitioner and/or symptoms of cutaneous, respiratory, or cardiovascular disturbance or fever. The primary outcome measure was the prevalence of Pen-A registration. Secondary outcomes included the risk of receiving a reserve antibiotic, the risk of death during hospitalization, the duration of hospitalization, and the risk of readmission within 4 and 12 weeks after discharge.

RESULTS. Of hospitalized patients, 5.6% had a Pen-A registration. Compared with non–Pen-A control patients, Pen-A subjects had a significantly higher rate of receiving a broad-spectrum antibiotic (relative risk, 1.38; 95% confidence interval, 1.22–1.56), of receiving 2 or more antibiotics (21.7% vs 16.9%), and of readmission within 12 weeks after discharge (relative risk, 1.28; 95% confidence interval, 1.10–1.49). There was no significant difference between the two groups in terms of duration of hospitalization, mortality during hospitalization, and risk of readmission within 4 weeks of discharge. Of interest, 14.5% of all Pen-A patients treated with antibiotics were exposed to penicillin during the hospitalization.

CONCLUSIONS. Pen-A registration in the hospital setting has a high impact on antibiotic treatment strategies, including the prescription of broad-spectrum antibiotics and multiple antibiotics as well as an increased risk of readmission within 12 weeks after discharge.

REVIEWER COMMENTS. The prevalence of penicillin allergy diagnosis in this hospitalized cohort was 5.6%, which is significantly lower than the reported prevalence of 11% to 15% in other studies conducted in the United States. This difference is likely due to the rigorous standardized interview used in this study. All too often, a report of penicillin allergy by the patient is recorded without attempts to verify the diagnosis or perform diagnostic skin testing. Given the negative impact of such a diagnosis on medical outcomes, it is incumbent upon the general practitioner and
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*Pediatrics* 2017;140;S190
DOI: 10.1542/peds.2017-2475FF

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