FDA Advise-ERR
Avoid Using The Error-Prone Abbreviation, TPA

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Problem: The US Food and Drug Administration (FDA) and ISMP continue to receive reports of medication errors involving wrong drug errors between **ACTIVASE** (alteplase) and **TNKASE** (tenecteplase). The reported errors are related to the use of the abbreviation, "t-PA" or "TPA." In June 2015, ISMP received a report of a wrong drug error where a nurse typed "t" in the automated dispensing cabinet and selected tenecteplase on the screen instead of alteplase because "alteplase was commonly referred to as tPA."[1]

Activase is a tissue plasminogen activator that FDA approved in 1987 for use in the management of acute myocardial infarction and later approved it for acute ischemic stroke and pulmonary embolism indications. TNKase, also a tissue plasminogen activator, was FDA approved in 2000 for the management of acute myocardial infarction only. Because Activase was the first tissue plasminogen activator approved, it has commonly been referred to as "t-PA" or "TPA" by healthcare providers. Unfortunately, the use of the abbreviations "t-PA" or "TPA" has led to confusion with the use of shorthand "TNK" for TNKase, leading to wrong drug errors.

Two cases of wrong drug errors resulting in mix ups between Activase and TNKase were initially reported in the May 29, 2003, ISMP Acute Care newsletter.[2] The errors stemmed from medication orders that were written as an initial dose of "t-PA 8 mg IV" and "t-PA 7 mg IV" for an acute ischemic stroke. Nurses involved in these cases assumed t-PA was shorthand for TNKase, and gave patients 8 mg and 7 mg of TNKase, respectively, instead of the intended drug, Activase.

Since the initial reports, we continue to receive cases of confusion between these two products. In 2014, a patient who experienced an ischemic stroke received TNKase instead of the intended Activase. Although it was unclear whether the abbreviation "tPA" was used in the order, the reporter attributed the wrong drug error to confusion between the abbreviations "TNK" and "TPA" because Activase was frequently called "TPA."

Wrong drug errors between TNKase and Activase can be attributed to the fact that both have similar settings of use (emergency departments, critical care areas) and patient populations (cardiac events). However, the use of the abbreviation "TPA" is also a significant contributing factor that led to the wrong drug errors. The abbreviations "TPA," "tape," and "TNK" are listed on the Drug Name Abbreviation section of the ISMP List of *Error-Prone Abbreviations, Symbols, and Dose Designations*.[3] Despite ISMP's recommendations[4] to avoid abbreviating drug names, the continued use of the abbreviation "TPA" has led to confusion between Activate and Tankage. Likewise, the continued use of the abbreviation "TPA" may also stem from frequent but inappropriate use of the abbreviations "tPA," "TPA," and "rt-PA" in published medical literature when referring specifically to alteplase.[5]

The consequences of giving patients with ischemic stroke TNKase instead of Activase include the failure to administer a drug of known effectiveness (Activase) and the potential for overdose—the dose for Activase (0.9 mg/kg)[6] is often higher than the maximum labeled TNKase dose for acute myocardial infarction. An overdose of TNKase may increase the risk of intracranial hemorrhage, retroperitoneal bleed, extended hospitalization, and death.

Recommendations: Since Activase, TNKase, and **RETAVASE** (reteplase), are all tissue plasminogen activators, referring to any one of these products as "TPA" may lead to confusion regarding the intended product. Therefore, we recommend the following:

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1. Never use abbreviations for drug names.
2. Do not use the abbreviation “TPA” and refer to all three tissue plasminogen activators by their brand names (Activase, TNKase, Retavase), established/generic names (alteplase, tenecteplase, reteplase), or both in all verbal and written communications.
3. Do not use “TNK” as an abbreviation for TNKase.
4. Remove the abbreviation “TPA” and “TNK” from all standardized order sets, computerized provider order entry screens, and treatment protocols to avoid confusion.
5. Since Activase, but not TNKase or Retavase, is approved for use in the management of ischemic stroke and pulmonary embolism, prescribers should state the indication on prescription orders to help ensure the correct drug is ordered and dispensed.
6. Consider the use of alerts for TNKase in electronic prescriber order entry systems and/or automatic dispensing cabinets (e.g., “Warning: Frequently confused with Activase [alteplase], verify the correct drug for the appropriate indication”).

An FDA video on this topic is available at: www.medscape.com/viewarticle/850514.

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References

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2. ISMP. Thrombolytic alphabet soup: A recipe for disaster. *ISMP Medication Safety Alert!* 2003;8(11):2-3.
3. ISMP’s List of Error-Prone Abbreviations, Symbols, and Dose Designations [Internet]. Horsham (PA): Institute for Safe Medication Practices. 2013 [cited 2014 Nov 12]. Available from: www.ismp.org/tools/errorproneabbreviations.pdf.
4. ISMP. Communicate alteplase dose and indication. *ISMP Medication Safety Alert!* 2008;13(17):1-2.
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