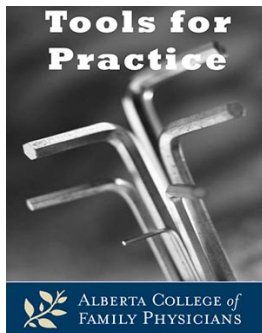


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Generic Versus Brand Name: The other drug war

Clinical Question: Is there any benefit to prescribing brand name medications versus generic brands?

Bottom-line: Based on the best available evidence, generic medications are bioequivalent and produce similar clinical outcomes to brand name medications.

Evidence:

- Bioequivalence:¹
 - Regulators require 90% confidence intervals for the maximum peak concentration (C_{max}) and total drug exposure over time (AUC) be within the limits of 0.80-1.25.
 - This means the absolute differences in bioequivalence must be no more than ~5-7%.
 - Between 1996-2007, 2070 single-dose bioequivalence studies showed the average difference in C_{max} and AUC was 4.35% and 3.56%, respectively.
 - 98% of studies showed AUC of generic and innovator products' differed by <10%.
 - Generic and brand name levothyroxine have been shown to be bioequivalent.²
- Clinical outcomes (brand name vs. generic medications):
 - Systematic review (38 trials) of cardiovascular medications:³
 - Clinical equivalence was shown in 35 of 38 trials including all β -blockers, anti-platelets, statins, ACEI, alpha-blockers, class-1 antiarrhythmic agents, and warfarin trials; most diuretics (10 of 11) and calcium channel blocker (5 of 7) trials.
 - Differences in single outcomes for three trials:
 - Brand name furosemide produced more diuresis in 1985 trial.
 - Calcium channel blockers: Two found differences in the PR interval on electrocardiogram but no associated changes in heart rate or other clinical outcomes.
 - Systematic review of warfarin:⁴
 - Five trials (higher level evidence): No statistically significant difference in INR or dosage changes required.
 - Six observational studies (lower level evidence): Inconsistent results at higher risk of bias.

Context:

- Of 43 editorials on generic medication issues, 23 (53%) expressed a negative view of generic substitution,³ while only 8% of trials found any differences in any outcomes.³
- If there were important clinical differences between generic and brand name medications, companies would do studies to prove brand name superiority and prevent losing millions of dollars from generic substitution.
 - In fact, one company tried to suppress data demonstrating equivalence of its product and related generics.⁵
- Brand name and generic medications may contain different inactive components (fillers and binders) and may look different.

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