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factors should also be taken into account when considering the prevalence of and potential interventions to reduce prescription errors.

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#### References

- Tully MP, Ashcroft DM, Dornan T, et al. The causes of and factors associated with prescribing errors in hospital inpatients: a systematic review. Drug Saf 2009; 32 (10): 819-36
- Lewis PJ, Dornan T, Taylor D, et al. Prevalence, incidence and nature of prescribing errors in hospital inpatients: a systematic review. Drug Saf 2009; 32 (5): 379-89
- Lesar TS, Briceland LL, Delcoure K, et al. Medication prescribing errors in a teaching hospital. JAMA 1990 May 2; 263 (17): 2329-34
- Purdy BD, Raymond AM, Lesar TS. Antiretroviral prescribing errors in hospitalized patients. Ann Pharmacother 2000 Jul-Aug; 34 (7-8): 833-8
- Cohen MR, Davis NM. Drug name suffixes can cause confusion. Am Pharm 1992 Apr; NS32 (4): 21-2
- Grunewald RA, Mack CJ. Medical errors: different formulations of drugs often look confusingly similar. BMJ 2001 Jun 9; 322 (7299): 1423
- Lesar TS. Tenfold medication dose prescribing errors. Ann Pharmacother 2002 Dec; 36 (12): 1833-9
- Chappell K, Newman C. Potential tenfold drug overdoses on a neonatal unit. Arch Dis Child Fetal Neonatal Ed 2004 Nov; 89 (6): F483-4
- Kozer E, Scolnik D, Jarvis AD, et al. The effect of detection approaches on the reported incidence of tenfold errors. Drug Saf 2006; 29 (2): 169-74
- Wheeler DW, Carter JJ, Murray LJ, et al. The effect of drug concentration expression on epinephrine dosing errors: a randomized trial. Ann Intern Med 2008 Jan 1; 148 (1): 11-4
- Oldridge GJ, Gray KM, McDermott LM, et al. Pilot study to determine the ability of health-care professionals to undertake drug dose calculations. Intern Med J 2004 Jun; 34 (6): 316-9
- Rolfe S, Harper NJ. Ability of hospital doctors to calculate drug doses. BMJ 1995 May 6; 310 (6988): 1173-4
- Simpson CM, Keijzers GB, Lind JF. A survey of drug-dose calculation skills of Australian tertiary hospital doctors. Med J Aust 2009 Feb 2; 190 (3): 117-20
- Wheeler DW, Remoundos DD, Whittlestone KD, et al. Doctors' confusion over ratios and percentages in drug

- solutions: the case for standard labelling. J R Soc Med 2004 Aug; 97 (8): 380-3
- Wheeler DW, Wheeler SJ, Ringrose TR. Factors influencing doctors' ability to calculate drug doses correctly. Int J Clin Pract 2007 Feb; 61 (2): 189-94
- Scrimshire JA. Safe use of lignocaine. BMJ 1989 Jun 3; 298 (6686): 1494
- Kelly DA, Henderson AM. Use of local anesthetic drugs in hospital practice. BMJ (Clin Res Ed) 1983 Jun 4; 286 (6380): 1784
- Wheeler DW, Remoundos DD, Whittlestone KD, et al. Calculation of doses of drugs in solution: are medical students confused by different means of expressing drug concentrations? Drug Saf 2004 Oct; 27 (10): 729-34
- Wheeler SJ, Wheeler DW. Medication errors in anaesthesia and critical care. Anaesthesia 2005 Mar; 60 (3): 257-73

# The Authors' Reply

We would like to thank Drs Mani and Wheeler for their interest in our two systematic reviews. [1,2] The authors suggest that the studies they describe in their letter were not included in our reviews because they were possibly perceived as administration rather than prescription errors. The majority of their studies, however, did not fulfill our inclusion criteria. Some investigated single groups of drugs [3-6] or single types of error. [7-9] Others reported the opinion or knowledge of prescribers in general, rather than opinion or knowledge about individually identified errors. [10-15] Finally, some were comments or narrative reviews rather than reporting empirical data. [16,17]

That said, we wholeheartedly agree with the authors' statement that such dosage errors have the potential for considerable patient morbidity. There is much work still to be done to investigate how to effectively reduce the prevalence of all types of prescribing errors.

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### References

- Lewis P, Dornan T, Taylor D, et al. Prevalence, incidence and nature of prescribing errors in hospital inpatients: a systematic review. Drug Saf 2009; 32 (5): 379-89
- Tully MP, Ashcroft DM, Dornan T, et al. The causes of and factors associated with prescribing errors in hospital inpatients: a systematic review. Drug Saf 2009; 32 (10): 819-36
- Purdy BD, Raymond AM, Lesar TS. Antiretroviral prescribing errors in hospitalized patients. Ann Pharmacother 2000; 34 (7-8): 833-8
- Kelly DA, Henderson AM. Use of local anesthetic drugs in hospital practice. Br Med J (Clin Res Ed) 1983; 286 (6380): 1784
- Wheeler DW, Carter JJ, Murray LJ, et al. The effect of drug concentration expression on epinephrine dosing errors: a randomized trial. Ann Intern Med 2008; 148 (1): 11.4
- Scrimshire JA. Safe use of lignocaine. BMJ 1989; 298 (6686): 1494
- Chappell K, Newman C. Potential tenfold drug overdoses on a neonatal unit. Arch Dis Child Fetal Neonatal Ed 2004; 89 (6): F483-4

- 8. Lesar TS. Tenfold medication dose prescribing errors. Ann Pharmacother 2002; 36 (12): 1833-9
- Kozer E, Scolnik D, Jarvis AD, et al. The effect of detection approaches on the reported incidence of tenfold errors. Drug Saf 2006; 29 (2): 169-74
- Simpson CM, Keijzers GB, Lind JF. A survey of drug-dose calculation skills of Australian tertiary hospital doctors. Med J Aust 2009; 190 (3): 117-20
- Rolfe S, Harper NJ. Ability of hospital doctors to calculate drug doses. BMJ 1995; 310 (6988): 1173-4
- Oldridge GJ, Gray KM, McDermott LM, et al. Pilot study to determine the ability of health-care professionals to undertake drug dose calculations. Intern Med J 2004; 34 (6): 316-9
- Wheeler DW, Wheeler SJ, Ringrose TR. Factors influencing doctors' ability to calculate drug doses correctly. Int J Clin Pract 2007; 61 (2): 189-94
- Wheeler DW, Remoundos DD, Whittlestone KD, et al. Doctors' confusion over ratios and percentages in drug solutions: the case for standard labelling. J R Soc Med 2004; 97 (8): 380-3
- 15. Wheeler DW, Remoundos DD, Whittlestone KD, et al. Calculation of doses of drugs in solution: are medical students confused by different means of expressing drug concentrations? Drug Saf 2004; 27 (10): 729-34
- Cohen MR, Davis NM. Drug name suffixes can cause confusion. Am Pharm 1992; NS32 (4): 21-2
- Grunewald RA, Mack CJ. Medical errors: different formulations of drugs often look confusingly similar. BMJ 2001; 322 (7299): 1423