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Research on Pharmacist Staffing and Medication Safety in Small Rural Hospitals: What We Know and Don't Know

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Research on Pharmacist Staffing and Medication Safety in Small Rural Hospitals

- University of Minnesota Survey of Small Rural Hospitals on Pharmacist Staffing, Use of Technology and Medication Safety
- University of Nebraska Projects on Medication Error Reporting by Critical Access Hospitals
- AHSP National Survey of Pharmacy Practice In Hospital Settings
- University of Minnesota and Subsequent Studies of Telepharmacy in Rural Hospitals



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University of Minnesota Survey of Small Rural Hospitals: Research Questions

(Casey et al, 2005; Casey et al, 2006)

- What is the capacity of small rural hospitals to implement medication safety practices, in terms of pharmacist staffing and the availability of technology?
- What key factors are related to rural hospitals' pharmacist staffing, their use of technology, and implementation of medication safety practices?



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University of Minnesota Survey: Methods

- Phone survey of pharmacy directors/pharmacists in 2005
- National sample of rural hospitals with <100 staffed beds
- 95% response rate
- Responding hospitals: 165 with 25 or fewer staffed beds, 126 between 26 and 50 staffed beds, 96 over 50 staffed beds
- Survey questions based on review of literature with input from pharmacists practicing in small rural hospitals
- Survey data linked to American Hospital Association, Medicare Cost Report, and CMS case mix data

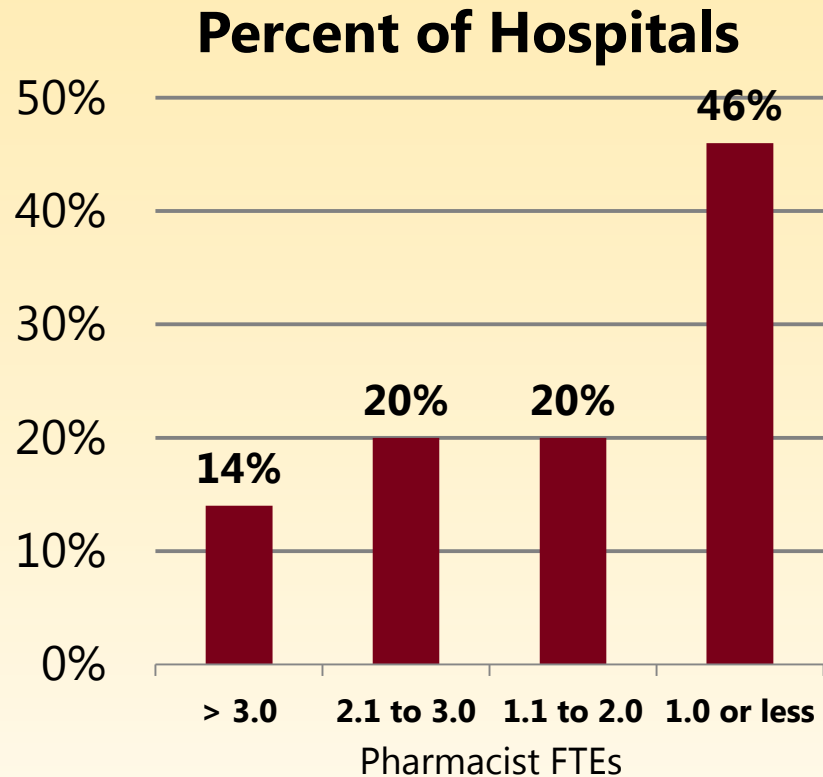


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University of Minnesota Survey: Pharmacist Staffing Results

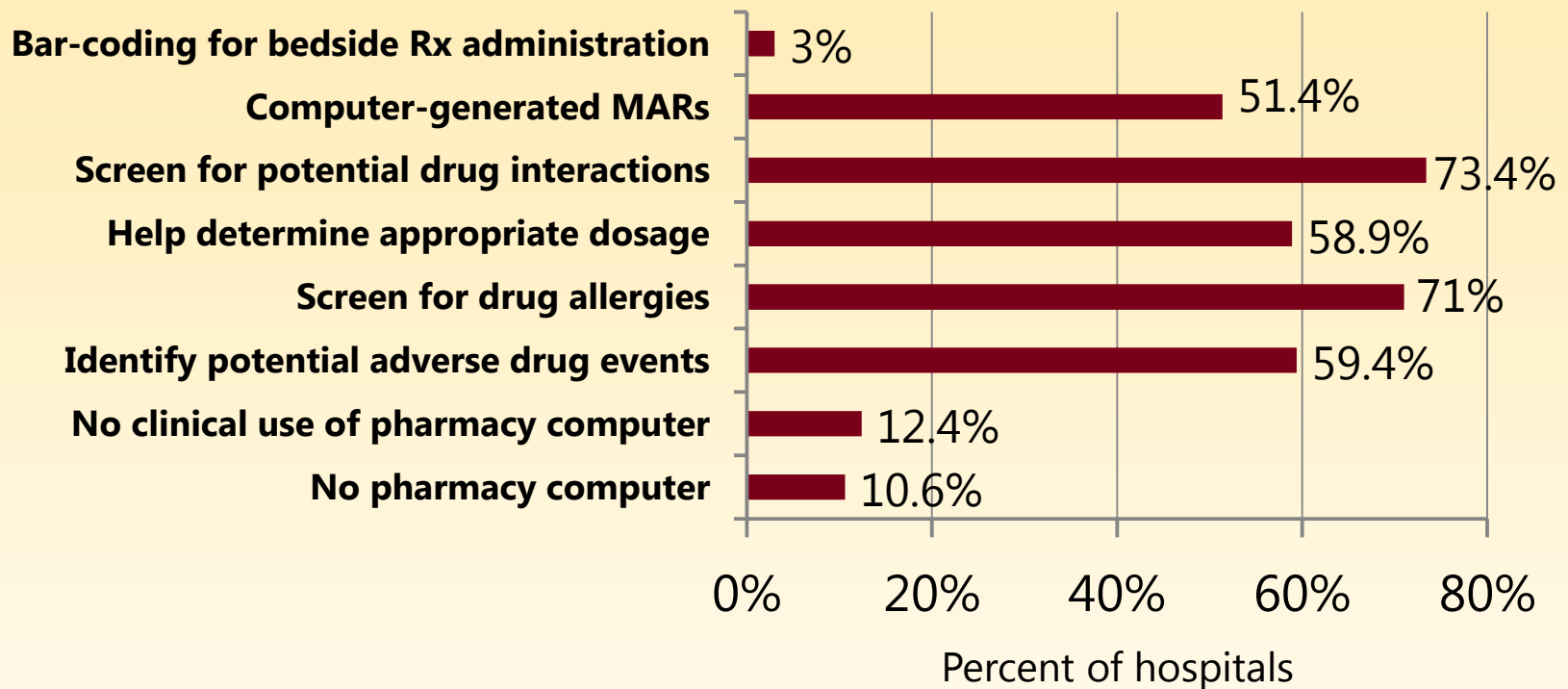
Pharmacist staffing is significantly higher in rural hospitals with:

- higher patient volume
- more seriously-ill patients (Medicare case mix index)
- Joint Commission accreditation
- better financial conditions (net other income, net operating margin)
- public ownership (compared to for-profit)



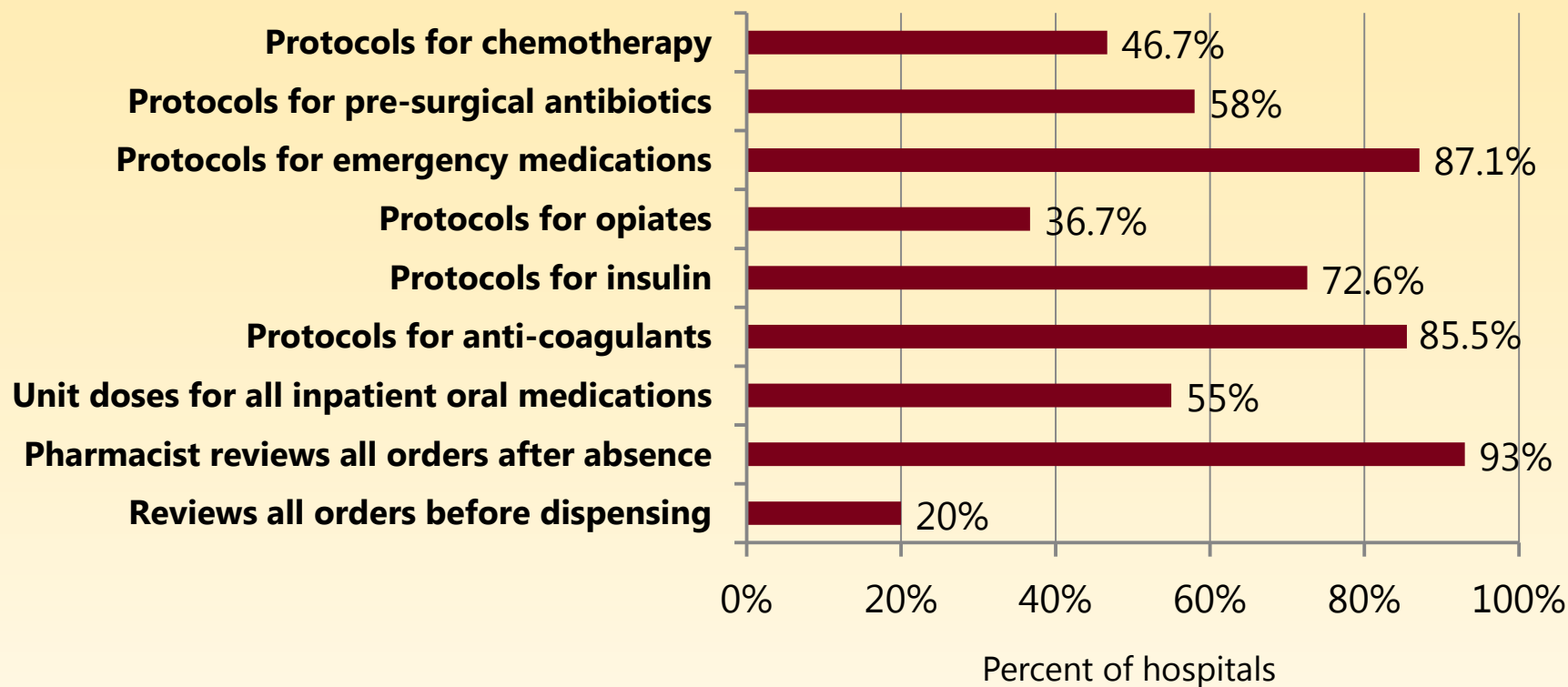
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University of Minnesota Survey: Small Rural Hospitals' Use of Medication- Related Technology



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University of Minnesota Survey: Protocols and Medication Safety Practices

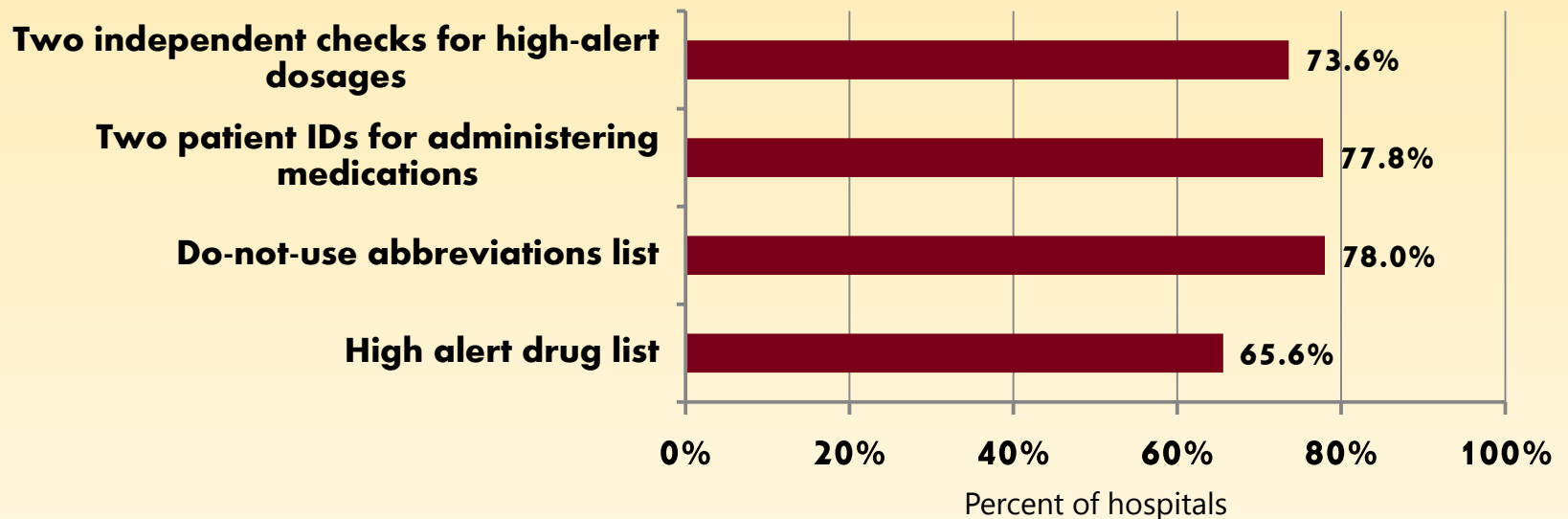


Note: questions regarding chemotherapy and pre-surgical antibiotic protocols were only asked of hospitals that provide chemotherapy and surgery.



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University of Minnesota Survey: Small Rural Hospitals' Implementation of Medication Safety Practices



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University of Minnesota Survey: Relationship between Pharmacist Staffing and Medication Safety Practices

- The amount of pharmacist staffing in a small rural hospital is significantly related to active pharmacist participation on key hospital committees that address medication issues
- Active pharmacist participation on hospital infection control committee is significantly related to implementation of protocols for pre-surgical antibiotic prophylaxis
- Active pharmacist participation on hospital medication/patient safety committee is significantly related to implementation of four key medication safety practices



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University of Minnesota Survey: Conclusions

- In hospitals with limited pharmacist coverage, pharmacists may not be able to take an active leadership role or spend significant time on medication safety activities.
- Options for small rural hospitals to increase pharmacist staffing include shared staffing among hospitals, use of telepharmacy, and models expanding pharmacist role in community.
- Implementation of medication-related protocols and medication safety practices are areas where rural hospitals, especially non-accredited hospitals, could improve.
- Hospital financial status is significantly related to pharmacist staffing, use of technology, and implementation of medication safety practices.



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University of Nebraska Voluntary Medication Error Reporting Projects

(Jones et al, 2004; Jones et al, 2008)

- Initial project involved 6 Critical Access Hospitals (CAHs); follow-up study compared 35 CAHs with hospitals with 24/7 pharmacist coverage.
- Standardized reporting of medication errors to MEDMARX.
- Limited pharmacist support resulted in fewer opportunities to learn from potential and near-miss errors, and limited ability to independently double-check provider prescribing.
- Hospitals with 15 or fewer hours of pharmacist support per week were significantly less likely to report intercepting medication errors before they reached patients than hospitals with pharmacists available 24/7.



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AHSP National Survey of Pharmacy Practice: Methods

(Pedersen et al, 2012)

- Mail-based survey of hospital pharmacy directors conducted in 2011.
- National sample of 1,401 hospitals with oversample of small hospitals.
- 40% response rate.
- Responding: 172 rural hospitals, 104 hospitals with fewer than 50 beds.



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AHSP National Survey of Pharmacy Practice: Small Hospital Results

- Hospitals with fewer than 50 beds
 - have an average of 1.9 FTE pharmacists vs. 11.7 FTEs for all hospitals;
 - are less likely to have pharmacist review of all medication orders before administration of first dose (44% vs. 95%-98% of hospitals with 200 or more beds);
 - are less likely to use bar-code-assisted medication-administration systems (34% vs. 50% overall); and
 - are less likely to have an inpatient CPOE system with CDSS (26% vs. 34% overall).



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University of Minnesota Telepharmacy Study: Purpose and Methods

(Casey et al, 2008; Casey et al, 2010)

- Analyze telepharmacy activities in rural hospitals and policies influencing telepharmacy adoption
- Review of literature, national organizations' policy positions, Medicare Conditions of Participation, state laws & regulations
- Ten states: AR, ID, MN, MT, ND, OK, SD, TX, UT, WA
 - Phone interviews with State Boards of Pharmacy about policy environment, laws and regulations, and telepharmacy initiatives
 - Phone interviews with rural hospitals and partners about telepharmacy activities and impact on medication safety



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University of Minnesota Telepharmacy Study: Telepharmacy Models

- Several different telepharmacy models being implemented in rural hospitals
 - Sharing of pharmacist services among hospitals in the same health care system
 - Network of hospitals that have joined together to share telepharmacy and other services
 - Contracting for telepharmacy services with a commercial telepharmacy company
 - Several small rural hospitals contracting with each other for telepharmacy services



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University of Minnesota Telepharmacy Study: Regulatory Environment

- Federal regulations were not a barrier to telepharmacy implementation
- Joint Commission standards were a major motivation for accredited facilities to use telepharmacy for after-hours medication order review
- At time of study, some states had adopted telepharmacy regulations that address elements of the ASHP policy statement on telepharmacy regulation and the NABP model act, but many states had not
- Many efforts were pilot projects or operating under temporary waivers of state regulations



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Subsequent Studies of Telepharmacy Implementation in Rural Hospitals

- Stratton et al (2008): implementation of after-hours pharmacy coverage for eight CAHs.
- Wakefield et al (2010a, 2010b): implementation of barcode medication administration and medication order review via telepharmacy in seven CAHs.
- Garrelts et al (2010): implementation of a telepharmacy program at five hospitals, including a 99-bed rural hospital, in an integrated delivery health system.
- Cole et al (2012): telepharmacy demonstration project at the University of California Davis Health System and six rural hospitals.



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Summary:

What We Know and Don't Know



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What We Know

- Many small rural hospitals continue to have limited hours of on-site pharmacist coverage and are less likely to have medication safety-related technology
- Small rural hospitals with limited pharmacist staffing are less likely to have implemented processes for preventing medication errors and to have pharmacist involvement in medication safety processes beyond medication dispensing
- More small rural hospitals are using alternatives such as telepharmacy to provide medication-order review services after-hours by a pharmacist



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What We Know

- Research on the relationship between clinical pharmacist services (e.g., admission/discharge medication reconciliation, therapeutic drug-monitoring) and patient outcomes has primarily been conducted in large academic hospitals
- AHRQ Evidence Report/Technology Assessment # 211 (March 2013) concludes that evidence supports use of clinical pharmacists to prevent adverse drug events, while acknowledging that much of the evidence is from academic medical centers and ICU settings in particular.



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What We Don't Know

- How much pharmacist staffing is needed to ensure operation of a safe and effective medication use system in a small rural hospital?
- What is the best allocation of pharmacist time to improve medication safety in small rural hospitals?
- To what extent is research regarding the impact of clinical pharmacist services on patient outcomes applicable to small rural hospitals?



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References

University of Minnesota Survey of Small Rural Hospitals on Pharmacist Staffing, Use of Technology and Medication Safety

- Casey et al. Pharmacist Staffing, Technology Use and Implementation of Medication Safety Practices in Rural Hospitals. Final Report. December 2005. Available at: http://rhrc.umn.edu/wp-content/files_mf/medication_safety.pdf
- Casey et al. Pharmacist Staffing, Technology Use and Implementation of Medication Safety Practices in Rural Hospitals. *Journal of Rural Health* 2006; 4:321-330.

University of Nebraska Projects on Medication Error Reporting by CAHs

- Jones et al. Translating Research into Practice: Voluntary Reporting of Medication Errors in Critical Access Hospitals. *Journal of Rural Health* 2004; 20:335-343.
- Jones et al. The Association between Pharmacist Support and Voluntary Reporting of Medication Errors: An Analysis of MEDMARX® Data. In: Henriksen et al, editors. *Advances in Patient Safety: New Directions and Alternative Approaches*. Rockville MD: Agency for Healthcare Research and Quality; 2008.

AHSP National Surveys of Pharmacy Practice In Hospital Settings

- Pedersen, Schneider and Scheckelhoff. ASHP National Survey of Pharmacy Practice in Hospital Settings: Dispensing and Administration - 2011. *Am J Health-Syst Pharm*. 2012; 69:768-85.



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References

University of Minnesota and Subsequent Studies of Telepharmacy

- Casey et al. Implementation of Telepharmacy in Rural Hospitals: Potential for Improving Medication Safety. Final Report. Dec. 2008. Available at: http://rhrc.umn.edu/wp-content/files_mf/telepharmacy.pdf
- Casey et al. Current practices and state regulations regarding telepharmacy in rural hospitals. *Am J Health-Syst Pharm*. 2010; 67:1085-1092.
- Cole et al. Rural Inpatient Telepharmacy Consultation Demonstration for After-Hours Medication Review. *Telemedicine and E-health*. 2012; 18(7):530-537.
- Garrelts et al. Impact of telepharmacy in a multihospital health system. *Am J Health-Syst Pharm*. 2010; 67: 1456-1462.
- Stratton et al. Implementing after-hours pharmacy coverage for critical access hospitals in northeast Minnesota. *Am J Health-Syst Pharm*. 2008; 65:1727-34.
- Wakefield et al. Implementation of a telepharmacy service to provide round-the-clock medication order review by pharmacists. *Am J Health-Syst Pharm*. 2010; 67: 2052-2057.
- Wakefield et al. A network collaboration implementing technology to improve medication dispensing and administration in critical access hospitals. *J Am Med Inform Assoc* 2010;17:584-587.



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