

Communication of medication orders by telephone – “Writing it right”

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Abstract

Communication is commonly cited as a contributing factor to adverse events causing patient harm (Baker et al., 2004). There are numerous ways and reasons that communication failures can occur, such as poor handwriting, transcription errors, lack of verification, lack of integration of information, and ineffective team functioning. Errors that can occur in critical care with the verbal communication and receipt of a telephone order will be highlighted. These examples, together with proposed strategies for improving telephone order safety, are intended to promote awareness and potential practice changes in the critical care environment.

Patients in critical care environments are provided with intensive care 24 hours a day, seven days a week. Unlike general patient care areas, patients in critical care often require a more immediate response to any change in status or abnormal laboratory findings. Furthermore, depending on the type and size of critical care unit, physician presence and availability may be reduced outside of team rounds or most responsible physician (MRP) visit. This can lead to use of alternate means, such as use of the telephone, to communicate changes in patient status and to receive orders. While computerized prescriber order entry (CPOE) could eliminate some of the problems outlined in this column, most health care facilities do not have such systems in place (Ackroyd-Stolarz, Hartnell, & MacKinnon, 2005).

Telephone orders (verbal orders received via the telephone) can be more error-prone than written orders due to the introduction of a number of variables not present when orders are written directly by the prescriber (Cohen, 1999). There is the potential to misinterpret spoken language as a result of accent or pronunciation (Allinson, Szeinbach, & Schneider, 2005; Cohen, 1999). Phonetic components of medication names when verbalized can increase the potential for error with sound-alike drug names (Cohen, 1999). Background noise and disruptions in a busy environment can add further complexity during receipt of telephone orders, as can reception clarity, in the case of cell phone use (Allinson et al., 2005; Cohen, 1999). Confusion with patients having the same or similar names can occur from both the prescriber's and the order receiver's end (Allinson et al., 2005; NCC MERP, 2001) and, in some cases, the prescriber (e.g., physician on call) or the receiver (e.g., nurse other than the one assigned to care for the patient) may not be fully

familiar with the patient. This could result in inappropriate medication orders or the wrong patient receiving a medication. Furthermore, a prescriber requested to give a telephone order may be interrupted while performing other patient care activities, further affecting their concentration, and possibly adding to communication ambiguity (AHRQ, 2003).

Only the person giving the telephone order can verify it as accurate against what was intended (Cohen, 1999). Identification of an error in a telephone order by a prescriber relies on their memory of what was spoken (Cohen, 1999); the longer the time between the telephone order and the time of review and signing, the more difficult it may be to recognize a discrepancy. (Occasionally, a telephone order is signed off by a different prescriber rather than by the prescriber who gave the telephone order [e.g., MRP for on-call physician]. This can affect the ability to detect error, particularly if the order appears reasonable [medication, dosage, frequency] and aligns with existing memory and conveyed events regarding the patient's course of care and treatment.)

Certain doses are more prone to mix-ups (Cohen, 1999). Doses in the teens, such as “15” or “16”, have been misheard as “50” or “60”, respectively.

“... a physician called in an order for “15 mg” of hydralazine to be given intravenously every two hours. The nurse, thinking that he had said “50 mg,” drew up two 20-mg vials and one-half of a third vial, which she administered to the patient. Within a few minutes, the patient developed tachycardia and had a significant drop in blood pressure. The nurse called the doctor. Fortunately, a rapid infusion of fluids restored the patient's blood pressure to a safe level. Repeating spoken orders to prescribers and pronouncing each digit of a number (i.e., “one five” mg instead of “15” mg) can help prevent misinterpretation.” (Cohen, 1999, p.11.6)

The ability to detect an error may be reduced after receipt of a telephone order (Cohen, 1999), particularly when there is perceived urgency, for example, when the same person who mishears the telephone order administers the medication and the medication is available as ward stock. At times, errors in telephone orders are recognized when other practitioners identify them as being “outside” of usual treatments or doses. Doses with the number “two” in them can be misinterpreted as “to”, resulting in the dose being interpreted as a dose range.

“... a telephone order for digoxin 0.125 mg, which was heard and transcribed as a dose range of “.1 - 5 mg.” Fortunately, a 5 mg dose for ... digoxin is easily recognizable as an error and no overdose was actually given...” (ISMPCanada, 2001, May 30, p.2)

Alternatively, medications ordered as a dose range can be misinterpreted as a single dosage.

“A hospital pharmacist received an order for a ‘fentanyl drip 5,200 mcg per hour,’ which a nurse had just transcribed after accepting a telephone order. The pharmacist called the nurse

to clarify the dose. The nurse confirmed that, although the dose was large, she had “read back” the order to the anesthesiologist several times to make sure she had heard the dose correctly. The pharmacist called the anesthesiologist himself, only to find that the intended order was for a fentanyl drip 50 to 100 mcg per hour.” (ISMP, 2004, July 15, p.1)

Read back should always take place during the process of telephone order communication (Cohen, 1999; AHRQ, 2003; NCC MERP, 2001) and should include verification of whether the medication is intended as a single dose or as a dose range. It is imperative that error prevention strategies include the read back of a telephone order, consisting of dose confirmation expressed in single digit format, e.g., “5,200 micrograms: five, two, zero, zero, micrograms” (ISMP, 2004, July 15, p.1).

Past experience can bias what practitioners hear and interpret, particularly when information is incomplete. Information (medication, dose, frequency) exchanged via telephone order must be complete (AHRQ, 2003; NCC MERP, 2001). The drug name should not be truncated or accepted in an abbreviated format (e.g., chemical symbol “K” for potassium), dose units must be identified (e.g., mmol for potassium chloride) and route of administration specified, including infusion volume when applicable (AHRQ, 2003; Cohen, 1999; Koczmar, Jelincic, & Dueck, 2005).

“An 81-year-old female maintained on warfarin for a history of chronic atrial fibrillation and mitral valve replacement developed asymptomatic runs of ventricular tachycardia while hospitalized. The unit nurse contacted the physician, who was engaged in a sterile procedure in the cardiac catheterization laboratory (cath lab) and gave a verbal order, which was relayed to the unit nurse via the procedure area nurse. Someone in the verbal order process said “40 of K.” The unit nurse (whose past clinical experience was in neonatal intensive care) wrote the order as “Give 40 mg Vit K IV now.” (AHRQ, 2003)

In this case, the pharmacist who received the written order was concerned that the high vitamin K dose might indicate an anticoagulant overdose or adverse reaction (ISMP, 2002, August 21). The pharmacist followed up with the physician and learned that the intended order was for “40 mEq of KCl po” (AHRQ, 2003). This is one example of how orders that are not transmitted directly between the bedside nurse and the prescriber can be error-prone. Having the extra step of a third individual increases complexity and reduces the effectiveness of the communication and verification processes (AHRQ, 2003).

Telephone orders or communications can also be misheard between prescribers. Medication names can sound alike. It is always best if the original prescriber writes their own order, but when this is not feasible, the medication name should be spelled out (Cohen, 1999; ISMP, 2002, February 20), such as “a-r-g-a-t-r-o-b-a-n” in the example below.

“A hospital had a near miss with an anticoagulant used for heparin induced thrombocytopenia (HIT). A hematologist who was treating the patient post-operatively gave the surgeon a telephone order to start argatroban (a direct thrombin inhibitor) 2 mcg/kg/minute. The surgeon mistook the order as **ORGARAN** (danaparoid) 2 units/kg/minute. He then called the OR pharmacist and gave another verbal order for an infusion of Orgaran 2 units/kg/minute. The pharmacist knew that Orgaran can be given by IV injection, but questioned the surgeon about this dose because it is usually given in units/kg/hour. The pharmacist then called the hematologist for verification. The hematologist verified the rate, but changed the dose to mcg/kg/minute thinking the pharmacist said “argatroban” when he really said “Orgaran.” The pharmacist then used a conversion factor to convert Orgaran units to micrograms and he dispensed the drug. Although the rate still did not make sense because the bag that was made would run out very quickly, the pharmacist still dispensed it. However, about 10 minutes later, the pharmacist felt uneasy and called the hematologist back. After some conversation, it was discovered that the hematologist had ordered argatroban 2 mcg/kg/minute, not Orgaran. The order was corrected before the patient got the wrong drug. Since these two sound-alike drugs have similar indications and clinical usage (danaparoid can also be used in patients with HIT), errors are likely to occur again.” (ISMP, 2002, February 20, p.2)

Even when telephone orders are heard and written correctly, they can be written with poor legibility or with the use of unclear or ambiguous abbreviations (Koczmar

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et al., 2004). This can lead to misinterpretation by practitioners subsequently involved in processing the orders. Error-prone abbreviations were highlighted in a previous article and should be avoided, not only by prescribers but by all practitioners, including those who transcribe an order, as well as those who accept a telephone order and commit it to writing (Koczmar et al., 2005). In addition, numbers or extraneous marks included in the telephone order (e.g., initials, letters, check marks) can obscure or change the interpretation of a written order and should be avoided (ISMP, 2004, November 4). If numbering of orders is required, it is suggested to circle the number so that it is not misinterpreted as part of the order (ISMP, 2004, November 4).

“An order was written for “1.25 mg of Toradol x 1,” or so it seemed. Despite a spelling error (Tordol), that’s the way a pharmacist initially read the transcribed telephone order... Since the dose didn’t make sense, the pharmacist checked with the transcribing nurse, who responded by saying she’d numbered the order for 25 mg of TORADOL (ketorolac) IV using the number one followed by a period.” (ISMP, 2004, November 4, pp.2-3)

All practitioners, prescribers and facilities are encouraged to standardize their telephone order procedures and practices to enhance patient safety. Refer to the suggested recommendations in Tables One, Two, and Three.

(Although outside the scope of this article, standard communication procedures are important to consider and may include implementation of tools such as SBAR: **S**ituation, **B**ackground, **A**ssessment, **R**ecommendation. “SBAR is an easy-to-remember, concrete mechanism useful for framing any conversation, especially critical ones, requiring a clinician’s immediate attention and action. It allows for an easy and focused way to set expectations for what will be communicated and how between members of the team...” [Kaiser Permanente, 2003]. In addition, consideration should also be given to communication processes involving telephone reporting of laboratory values and other information [CCHSA, 2004].)

Communication in other high-risk industries includes standards where information received must be verified. For instance, in Canada, train engineers have regulations in which orders or clearance authority requested and received by radio communication from the railway traffic controller must be written down in a specific format and read back for verification (CN, 2003, p.61) (e.g., approval to enter a main line [CN, 2003, p.91] or to back up on a main line track [CN, 2003, p.94]). In response to such a radio request by a train engineer, the controller provides an order by radio communication. This order is written down by **both** the controller and train engineer on specific forms,

Table One: Suggested recommendations to practitioners receiving telephone orders
1. Ensure all telephone orders are complete (i.e., include the “five rights”: patient name, medication, dose, time(s)/frequency, and route) (Cohen, 1999; NCC MERP, 2001).
2. Record the order directly onto an order sheet in the patient’s chart as the order is received. (Be prepared when calling a physician for the possibility of a telephone order to be received. Do not write orders on a scrap piece of paper as transferring this information introduces another opportunity for error.) (Cohen, 1999).
3. Read back all telephone orders (AHRQ, 2003; Cohen, 1999; NCC MERP, 2001). (Some hospital policies require the practitioner to indicate, as part of the written telephone order, that a <i>read back</i> has occurred.)
4. Read back should include: <ul style="list-style-type: none"> • Spelling of drug name (use words to identify letters that are phonetically similar [e.g., “B as in Bob” versus “V as in Victor”] [Cohen, 1999; NCC MERP, 2001], may include trade name if this helps with clarity) and • Dose confirmation expressed as a single digit (e.g., “fifty milligrams: five, zero, milligrams”) (Cohen, 1999; ISMP, 2004, July 15; NCC MERP, 2001) or, if a dosage range is ordered, include this in the verification (e.g., “dosage range of fifty micrograms: five, zero, micrograms per hour up to and including one hundred: one, zero, zero, micrograms per hour intravenously”).
5. Verify indication for medication(s) ordered (NCC MERP, 2001). (The order needs to make sense according to the treatment plan for the patient [Cohen, 1999].)
6. Ask questions as needed (e.g., clarification, any concerns) (AHRQ, 2003; Cohen, 1999).
7. Consider review by a second practitioner before initiating an order , particularly for medications available in unit stock or when an over-ride is required to access a medication from an automated dispensing unit (AHRQ, 2003).
8. When pharmacy is expected to fill an order, a copy of the written order should be sent for review before the medication is dispensed (Cohen, 1999). (Copies of all orders should be sent to pharmacy to ensure a complete and up-to-date pharmacy medication record. This provides the opportunity for another check to prevent or limit perpetuation of an error, drug interactions, allergies, duplicate therapies, etc.)
9. Call the practitioner back if any questions or discrepancies arise (e.g., incomplete order noted, unusual dosage, etc.) (Cohen, 1999).

according to a standardized format. Authorization to follow the order is only given by the controller if the *read back* from the train engineer exactly matches the controller's written documentation. The *read back* is done according to protocol and *read back* of single digit numbers requires that the number is stated and immediately followed by being spelled out (e.g., "1: o-n-e"); multiple digits are read back as a complete number followed by single digits ("15: one, five") (CN, 2003, p.61). Even outside of high-risk industries, *read back* occurs commonly in service industries. For example, when ordering food for delivery, many operators include a read back of your order. And, in many drive-through food outlets with computerization and automation, electronic screens provide customers with the opportunity to read the screen as part of the order verification process.

Health care is high risk, and particularly so for critical care patients. Valuable learning exists in the error reports and communication issues highlighted. Examples from other high-risk industries provide additional strategies that can be considered when working to standardize communication procedures and processes with telephone orders. By working collaboratively, critical care practitioners can apply the recommendations in their daily practice in an effort to enhance patient safety. 

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References

- Ackroyd-Stolarz, S., Hartnell, N., & MacKinnon, N.J., (2005). Approaches to improving the safety of the medication use system. **Healthcare Quarterly**, **8**, 59-64.
- Agency for Healthcare Research and Quality. (2003). **Morbidity and mortality rounds on the web case and commentary: 40 of K**. Retrieved December 26, 2005, from <http://www.webmm.ahrq.gov/case.aspx?caseID=36>.
- Allinson, T.T., Szeinbach, S.L., & Schneider, P.J. (2005). Perceived accuracy of drug orders transmitted orally by telephone. **American Journal of Health-System Pharmacy**, **62**, 78-83.
- Baker, G.R., Norton, P.G., Flintoft, V., Blais, R., Brown, A., Cox, J., et al. (2004). The Canadian Adverse Events Study: The incidence of adverse events among hospital patients in Canada [Electronic version]. **Canadian Medical Association Journal**, **170**, 1678-1686.
- Canadian Council on Health Services Accreditation. **CCHSA Patient Safety Goals and Required Organizational Practices for 2005. Communiqué #2: December 2004**. Retrieved January 2, 2006, from <http://www.cchsa.ca/default.aspx?group=9§ion=PatientSafetyGoals>
- CN. (2003, December 1). Radio Protocol: Read back, Rule 123, Paragraph D, subsections 1, 2, and 3, p.61. **Canadian Rail Operating Rules**.
- CN. (2003, December 1). Track Clearance: Signal or permission to enter main track, Rule 568, p.91. **Canadian Rail Operating Rules**.
- CN. (2003, December 1). Track clearance: Reverse movement, Rule 573, p.94. **Canadian Rail Operating Rules**.

Table Two: Suggested recommendations to prescribers giving telephone orders

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|---|
| 1. When calling in a telephone order, confirm patient identity (NCC MERP, 2001), particularly when the telephone call is unexpected or not initiated by the practitioners in the unit or caring for the patient. |
| 2. Spell the name of the medication(s) . Use words to identify letters that are phonetically similar (e.g., "B as in Bob" versus "V as in Victor") (Cohen, 1999; NCC MERP, 2001). |
| 3. Consider providing both the generic and trade names of the medication for clarity (NCC MERP, 2001). |
| 4. Avoid truncating, using abbreviations, short forms or acronyms for drug names to avoid confusion (e.g., state "morphine" rather than "morph", "hydrochlorothiazide rather than "HCTZ", "potassium chloride" rather than "K") (Cohen, 1999; Koczmara et al., 2005; NCC MERP, 2001). |
| 5. Avoid confusion with spoken numbers by restating the dosage in single digits (e.g., "15 milligrams: one, five, milligrams" to help distinguish it from "50 milligrams: five, zero milligrams" [Cohen, 1999; NCC MERP, 2001]. If a dose range is ordered, include this in the verification [e.g., "dosage range of 0.625 mg up to and including 5 mg IV"].) |
| 6. Provide complete dosage and route for all medications ordered and comply with formulary guidelines (e.g., mmol for potassium; mg; mcg; mcg/kg/min; mg/kg/hour; mg rather than mL for oral suspensions; include infusion volume when applicable). |
| 7. Avoid abbreviations for the dose frequency (e.g., state "three times a day" instead of "tid", or "every eight hours" instead of "q8h") (NCC MERP, 2001). |
| 8. Provide the indication for medication(s) ordered (NCC MERP, 2001). |
| 9. Obtain a read back of the entire telephone order (Cohen, 1999; NCC MERP, 2001). |
| 10. Ensure the order is clear and understandable to the person receiving the telephone order (e.g., by asking the practitioner receiving the telephone order if they have any questions with which you can assist) (AHRQ, 2003). |
| 11. Review and sign telephone orders as soon as possible (Cohen, 1999; NCC MERP, 2001). |

Cohen, M.R. (1999). **Medication errors: Causes, prevention and risk management.** Washington, D.C.: American Pharmaceutical Association Foundation.

Institute for Safe Medication Practices. (2001, May 30). Safety briefs. **Medication Safety Alert!**, 6, 2.

Institute for Safe Medication Practices. (2002, August 21). "40 of K" is not OK. **Medication Safety Alert!**, 7, 2.

Institute for Safe Medication Practices. (2002, February 20). Safety Briefs. **Medication Safety Alert!**, 7, 1.

Institute for Safe Medication Practices. (2004, July 15). Safety briefs: Single digits. **Medication Safety Alert!**, 9, 1.

Institute for Safe Medication Practices. (2004, November 4). Safety briefs: Number 1. **Medication Safety Alert!**, 9, 2-3.

Kaiser Permanente. Institute for Healthcare Improvement. (2003). **SBAR technique for communication: A situational briefing model.** Retrieved January 2, 2006, from <http://www.ihl.org/IHI/Topics/PatientSafety/SafetyGeneral/Tools/SBARTechniqueforCommunicationASituationalBriefingModel.htm>

Koczmara, C., Jelincic, V., & Dueck, C. (2005). Dangerous abbreviations: "U" can make a difference. **Dynamics**, 16(3), 11-16.

National Coordinating Council for Medication Error Reporting and Prevention. (2001, February 20). **Council recommendations: Recommendations to reduce medication errors associated with verbal medication orders and prescriptions.** Retrieved December 27, 2005, from <http://www.nccmerp.org/council/council2001-02-20.html>

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Table 3: Suggested recommendations for facilities regarding telephone orders

1. **Establish or ensure telephone order policies include** (Cohen, 1999; NCC MERP, 2001):
 - **Read back**
 - **Limitations** (e.g., prohibit the use of telephone orders [and verbal orders given in person] for chemotherapeutic agents).
2. **Clearly define the situations in which telephone orders are acceptable, and the personnel authorized to give and receive them** (ISMP Canada, 2002).
3. **List the components required in a telephone order** (NCC MERP, 2001), **such as:**
 - Name of patient
 - Medication name (generic; may include trade name if this helps with clarity)
 - Strength or concentration
 - Dose
 - Frequency
 - Route
 - Indication for medication
 - Prescriber name
 - Practitioner who received and wrote the order
 - Consider other components, such as the requirement of noting the patient's weight for speciality areas, such as neonates or paediatrics

Note: All orders should comply with formulary guidelines.
4. **Include time frame expectations for a prescriber to read and sign the telephone order** (Cohen, 1999).
5. **Educate practitioners regarding telephone order expectations, such as read back and how to perform it – refer to Tables One and Two.** Use of error examples can assist with rationale. Some facilities require practitioners to indicate that a *read back* has occurred as part of the telephone order.
6. **Eliminate the use of abbreviations** (AHRQ, 2003; Cohen, 1999; Koczmara et al., 2004; NCC MERP, 2001).