ABSTRACT
The rise in assisted living facilities (ALFs), coupled with residents with increasingly complex conditions, leads to unanticipated problems linked to medication management. The purpose of this study was to describe one western state's scope of medication-related problems, the relationship of problems to facility characteristics, and the nature of the problems using state surveyors' reports from routine inspections and complaint investigations. Of the 1,335 ALFs surveyed for 2007-2008, 61.8% received a medication-related citation. Of the 1,558 allegations, 60.3% involved individual residents, with 25.2% of these being medication related. The variability in state regulations obscures an accurate understanding of the problem. Complex medication regimens delivered by unlicensed assistive personnel place residents at risk for negative health consequences. More nursing oversight is critically needed to ensure the health and safety of the new generation of ALF residents.

It is well established that medications are a major problem for frail older adults in the United States. Ample literature verifies the many problems associated with misuse of drugs, polypharmacy, and adverse drug events. In fact, adverse drug events are the most common medical error in the United States (Institute of Medicine, 2000). With the current emphasis on safety, many factors that contribute to the medication-related problems experienced by frail older adults, such as errors that occur as older adults transition between care settings and among providers and i-
sues associated with the prescribing practices of care providers, have been studied in both hospitals and nursing homes. However, fewer studies have been conducted about medication management difficulties in assisted living facilities (ALFs). This article reports on an analysis of medication-related problems in ALFs in one western state.

BACKGROUND
Assisted Living Facilities Versus Nursing Homes

ALFs are residences used by people who cannot live alone but who do not need either the health care monitoring or the nursing care required by individuals in nursing homes (WordIQ, n.d.). Some estimates suggest that every day approximately 1 million older adults in the United States receive care in ALFs (Assisted Living Federation of America, n.d.). That number may seriously underestimate the number of older adults actually served, given data showing that the number of older adults served and the number of ALFs in this country are steadily increasing (Rosenblatt et al., 2004). In addition, ALFs vary greatly in size and are almost completely state regulated. In many states, small ALFs (3 to 10 beds) are referred to as board and care homes or adult foster care homes, which are not licensed as ALFs and are viewed essentially as family-run small businesses. In many states, older adults receiving care in these small facilities are not included in the count.

Several factors distinguish ALFs from nursing homes. First, ALFs were originally designed to provide supportive services in a residential environment to individuals with stable medical conditions and modest care needs, such as assistance with activities of daily living (ADLs), housekeeping, meals, and transportation. Second, medication management was not a prominent feature of these supportive services. In fact, as ALFs were originally envisioned, residents were supposed to be capable of self-administration of medications or with some assistance. Third, ALFs were designed based on a “social” as opposed to a “health care” model. As a consequence of these three factors, the ALF care model was operationalized in most states by a staffing model that also distinguishes them from nursing homes.

Staffing Differences

Unlike staff in nursing homes, ALF care staff are not licensed professionals or even certified nursing assistants. While large corporate ALFs may have a nursing or medical director, currently no state requires this kind of service (Mitty, 2009). In small ALFs, the probability of having any licensed personnel on staff is small. Generally, ALF employees are unlicensed assistive personnel who are “typically service workers trained to provide multiple types of services for residents” (Munroe, 2003, p. 100). Unlicensed assistive personnel are often not even supervised by licensed personnel, although facility owners/managers, who usually have a minimal level of training, are required to provide supervision.

Description of Residents

If ALFs were currently serving the older adults they were originally designed to serve, few problems associated with medication administration would likely exist. However, many changes have occurred that call into question the safety of medication management in ALFs. Although at one time ALF and nursing home (NH) residents were distinctly different, recent data suggest they are more similar than different. For example, 68% of ALF residents have mild to moderate dementia (Boustani et al., 2005; Rosenblatt et al., 2004), 56% exhibit behavioral symptoms of dementia (Gruber-Baldini, Boustani, Sloane, & Zimmerman, 2004), 26% exhibit anxiety disorders, and 59% show sleep disturbances similar to those of nursing home residents (Rao et al., 2008).

Medication Management

One of the consequences of this resident profile is a plethora of medication prescriptions. The kinds of medications prescribed vary. However, potent psychoactive medications such as antidepressant, antipsychotic, anxiolytic, and hypnotic drugs are frequently prescribed. Some data suggest that care management of ALF residents may be even more complicated than that of nursing home residents. For example, one study showed that, on average, ALF residents have more physicians taking care of them than nursing home residents and are prescribed more medication—as many as 10 scheduled medications and 3 as-needed medications per resident (Mitty, 2009). In addition, medication “assistance” has become more the rule than the exception. Mitty (2009) found that 80% to 100% of ALF residents required assistance. Data show there is great disparity in the regulatory definitions of “assistance,” resulting in widely divergent application of these regulations both within and between states (Mitty & Flores, 2007; Reinhard, Young, Kane, & Quinn, 2006; U.S. General Accounting Office, 1999). Particularly important is that the line between “assistance” and “administration” is becoming more blurred as unlicensed assistive personnel assume responsibility for administering medications, with or without professional supervision (Mitty, 2009).

Although the unlicensed assistive personnel model of care delivery is used in ALFs across the country, very few studies have evaluated the safety of the model with regard to medication management. One exception is Young et al.’s (2008) study, which found a medication error rate
of 8.2%, excluding errors related to medication timing. Several high-risk drugs, such as warfarin (Coumadin®), furosemide (Lasix®), and insulin, resulted in negative health consequences (Young et al., 2008). Hughes, Wright, and Lapane (2006) evaluated the use of unlicensed assistive personnel with specialized medication training, called medication technicians. ALFs using medication technicians, which tended to be very large (more than 200 beds), had a medication error rate of at least 5% documented during the survey process and were more likely to be cited compared with comparably sized ALFs that did not use medication technicians. Spellbring and Ryan (2003) described a training program for unlicensed assistive personnel that allowed them to assume a more active role in medication administration. Although the delegating nurses involved in the study indicated anecdotally that the program helped prevent or decrease errors in administration, no data were provided to support that claim.

The few studies on the safety of medication management by unlicensed assistive personnel is not surprising given the inaccessibility of data. Currently ALFs are almost completely state regulated, and there is no central and consistent mechanism for reporting errors. Two strategies have been used to overcome the difficulty of inaccessible data. The first has been to use direct observation, as in Young et al.’s (2008) study. However, the logistical and economic problems of direct observation, particularly in small ALFs, are obvious. The second strategy has been to use data from state-regulated facility surveys. These data are both a blessing and a curse. They are a blessing because they are open for public inspection and, thus, are available for study. They also usually reflect information about routine inspections, as well as complaint investigations. They are a curse for a number of reasons, including variability in state survey schedules and the fact that, in many states, small facilities are not included in the survey schedules.

In addition, the form of the data is problematic in that the facility—not the individual resident or employee—is the unit of analysis. As a consequence, while it may be possible to describe facility characteristics (e.g., size, geographical location, level of care as defined by the state), it is virtually impossible to determine which employees are responsible for the errors, the characteristics of the residents involved, or the kinds of medications involved. Further, while the particular regulation that was violated and resulted in the citation is identified, inspectors’ narrative reports, which might provide both background and context for the citation, may not be part of the public record. Despite these limitations, state survey data are the one consistent data source that can be used to characterize problems associated with medication administration in ALFs, and it was the data source used in this study.

STUDY PURPOSE

The purpose of this study was to describe one western state’s scope of medication-related problems, the relationship of problems to facility characteristics, and the nature of the problems using state surveyors’ reports from routine inspections and complaint investigations. The study was guided by the following research questions:

- On the basis of citations given by state surveyors during regular inspections, how common are medication-related citations compared with citations for other problems, and are there associations among medication-related citations and facility characteristics (e.g., kind of facility, level of care, geographical location)?
- On the basis of findings from complaint investigations, how frequent are medication-related allegations, how frequently are allegations substantiated, how frequently are adverse events as a result of substantiated medication-related allegations, and are substantiated allegations associated with facility characteristics?

METHOD

This study used a descriptive design and involved secondary analysis of publicly available data and documents from the Arizona Department of Health Services (ADHS). The original focus of the study was mistreatment of older adults, but the frequency of medication-related problems led to this analysis. A University Institutional Review Board exemption was approved after completion of a Project Review Form with information about the data and how the data and other documents would be accessed.

Arizona was selected as the study site for a number of reasons. First, in many ways, Arizona’s ALFs are representative of ALFs in many states. ALFs in Arizona rely exclusively on the unlicensed assistive personnel staffing model. Like 70% of states, Arizona has no requirement that licensed staff administer medications in ALFs. Like 50% of states, there is no requirement for any licensed staff to be employed. Like 61% of states, there are no specified hours of medication training for unlicensed assistive personnel (Arizona Secretary of State, n.d.).

Second, types of facilities are clearly defined by law and include, unlike many other states, small facilities (3 to 10 beds). These small facilities were of particular interest as they are the least likely to have any licensed staff. Arizona has only two kinds of facilities: assisted living homes (facilities with 3 to 10 beds) and assisted living centers (facilities with more than 10 beds).
Third, the level of care provided is state regulated and includes only three categories:

A Supervisory care services, defined as general supervision, including daily awareness of resident functioning and continuing needs, the ability to intervene in a crisis, and assistance with residents’ self-administration of prescribed medications.

B Personal care services, defined as assistance with ADLs that can be performed by staff without professional skills or professional training and includes the administration of medications and treatments by a nurse, family member, or an employee, with the approval of the attending primary care provider who has 30 hours of general initial training and at least 6 hours of ongoing general training every 12 months (medication assistance training hours are unspecified).

C Directed care services, defined to include personal care services, provided to people who are incapable of recognizing danger, summoning assistance, expressing needs, or making basic care decisions.

These categories are graded so ALFs that are licensed to provide personal care services may also provide supervisory care services, and those licensed to provide directed care services may provide all three levels of care. The levels of care were of interest because the levels roughly correspond to residents’ medication self-administration capacities in that residents receiving supervisory care are most likely to have medication self-administration capacity, whereas those receiving directed care are most likely to require the assistance of unlicensed assistive personnel for medication management.

Fourth, Arizona is a state with both densely populated urban areas and sparsely populated rural areas that are far removed from health care facilities. Geographical location was of interest because the shortages of licensed professionals in the rural areas is well documented (Hart, Salsberg, Phillips, & Lishner, 2002; Ricketts, 2005). Therefore, regardless of size, ALFs in rural areas are likely to rely on unlicensed assistive personnel for medication management. Urban was defined as a designated area (ZIP code) with a population of greater than 1 million people or a medical center within 25 miles, and rural was defined as a designated area with a population of less than 1 million people and no medical center within 25 miles.

Finally, as it does for nursing homes, the ADHS Division of Licensing Services conducts systematic data collection on all licensed ALF annually, surveys of each licensed ALF, or a medical center within 25 miles, and rural was defined as a designated area with a population of less than 1 million people and no medical center within 25 miles.

Table 1

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Care plan</td>
<td>Each resident has a written service plan developed with the assistance and review of a nurse, and the service plan states whether assistance is required for self-administration of medication.</td>
</tr>
<tr>
<td>Medication administration procedures</td>
<td>There are written medication orders for each medication; the person administering the medication is either a family member, nurse, or other practitioner, or an employee authorized in writing by a physician; and as-needed medications are not given on a routine basis.</td>
</tr>
<tr>
<td>Medication administration record (MAR)</td>
<td>Separate MARs are maintained for each resident, which include a record of when medications were administered.</td>
</tr>
<tr>
<td>Policy</td>
<td>Facilities have written policies and procedures for assisting residents with medications, and the policies and procedures are approved by a physician, pharmacist, or RN.</td>
</tr>
<tr>
<td>Storage procedures</td>
<td>Medications are stored and controlled in locked areas, stored in their original containers, and properly destroyed when expired or discontinued.</td>
</tr>
</tbody>
</table>

**Data Collection**

Two datasets were constructed for this analysis. The first involved retrieval of citation data for all ALFs from the ADHS website for the period 2007 through 2008. Data in this dataset included facility name, license type, location, size, survey date, type of survey, and citation tags. Tags are the codes applied by surveyors that refer to the rule in the Arizona State Statutes (Arizona Secretary of State, n.d.) that was violated by the facility. There can be several citations in a single survey.

The second dataset was developed by purposive sampling of Statements of Deficiencies and Aspen Complaint Tracking forms for complaint investigations. Complaint investigations usually involve a surprise inspection and interviews with the involved parties (e.g., family members, residents, health care providers, facility managers/employees). Single complaints can contain multiple al-
Delegations, depending on whether the complaint involves more than one resident and/or more than one kind of violation. For example, one complaint might include an allegation that the facility is dirty and an allegation that medications are not properly administered for two residents. These would be three separate allegations. Surveyors have the power to deem an allegation as substantiated on the basis of their evaluation of evidence.

To construct the dataset, facilities were identified by reviewing all annual survey records on the ADHS website as well as narrative data to identify ALFs with complaint investigations and related enforcement actions that appeared suspicious for mistreatment. Then, field trips to ADHS offices were made to review facility files for the identified ALFs. All Aspen Complaint Tracking forms and Statements of Deficiencies from the facility were collected. Next, all collected Statements of Deficiencies and Aspen Complaint Tracking forms were content analyzed. The primary unit of analysis was the allegation, but allegations were also deconstructed, when possible, and coded separately for each individual resident involved in the allegation.

In addition to basic descriptive information about the facility (e.g., name, location, size), the analysis focused on the nature of the allegation; whether the allegation was substantiated; description of event associated with the allegation, such as hospitalization or emergency department visit; and health-related adverse events, such as physical deterioration, mental deterioration, and death. For medication-related incidents, data were also coded to identify the type of problem, such as a wrong medication, wrong person, and complicated regimen. All data were entered into SPSS version 15 for analysis. Interrater reliability for the content analysis was maintained at 80%.

**Data Analysis**

The first and second research questions were answered using frequency data and chi-square analyses to test for statistically significant associations. The third research question was answered by selecting from the narrative reports examples that represented typical medication-related content in the narrative reports.

**FINDINGS**

Answering the first research question, which related to describing medication-related problems identified during routine inspections, involved analysis of the first dataset. There were 2,745 routine inspections conducted in 1,335 ALFs in 2007-2008 (total ALFs in Arizona = 1,801). In these 2 years, there were 19,623 total citations, of which 3,609 were medication related. Of the 1,335 ALFs surveyed, 169 (12.7%) received no citations; however, 1,166 (87.3%) of the ALFs received at least one citation (range = 1 to 116 citations) for any reason. A total of 825 (61.8%) ALFs received medication-related citations. Table 1 defines the citation categories. The numbers of citations within categories of medication-related citations are described in Table 2. Medication-related citations constituted 18.9% (2007) and 17.8% (2008) of all citations. Of the five citation categories, the citations most commonly given in both years were for medication administration, recording, and storage procedures.

The first research question was also related to whether medication-related citations were associated with facility type (home or center), level of care (supervisory, personal, direct care), and geographical location (rural or urban). For policy citations, significant differences were found between rural and urban facilities and by facility type, but no significant difference was found related to level of care (Table 3). Urban facilities and assisted living centers (more than 10 beds) had more policy citations. For citations related to medication administration, recording, and storage procedures, there were significant differences for facility type and type of license, but no difference related to geographical location. The consistent pattern was that assisted living homes (3 to 10 beds) and those licensed to provide directed care had more citations for all three types of medication-related problems. Cita-

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**TABLE 2**

**MEDICATION-RELATED CITATIONS DURING THE 2-YEAR STUDY PERIOD**

<table>
<thead>
<tr>
<th>Citation</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Care plan</td>
<td>141 (7.1)</td>
<td>146 (9)</td>
</tr>
<tr>
<td>Medication administration procedures</td>
<td>468 (23.5)</td>
<td>456 (28.3)</td>
</tr>
<tr>
<td>Medication administration record</td>
<td>543 (27.2)</td>
<td>421 (26.1)</td>
</tr>
<tr>
<td>Policy</td>
<td>339 (17)</td>
<td>218 (13.5)</td>
</tr>
<tr>
<td>Storage procedures</td>
<td>504 (25.3)</td>
<td>373 (23.1)</td>
</tr>
<tr>
<td>Total medication-related citations per year/total citations</td>
<td>1,995/10,556 (18.9)</td>
<td>1,614/9,067 (17.8)</td>
</tr>
</tbody>
</table>

*Note. Percentages for care plan, medication administration procedures, medication administration record, policy, and storage procedures are calculated from the total medication-related citations. Percentages may not total 100 due to rounding.*

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Table 3: Comparison of Facility Characteristics and Selected Medication-Related Citations

<table>
<thead>
<tr>
<th>Medication-Related Problems</th>
<th>Facility Type</th>
<th>Level of Care Services</th>
<th>Geographical Location</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Center</td>
<td>Home</td>
<td>Directed</td>
</tr>
<tr>
<td></td>
<td>(n = 511)</td>
<td>(n = 2,250)</td>
<td>(n = 2,600)</td>
</tr>
<tr>
<td>Care plan</td>
<td>81/511 (15.9%)</td>
<td>220/2,247 (9.8%)</td>
<td>276/2,597 (10.6%)</td>
</tr>
<tr>
<td>Medication administration procedures</td>
<td>100/497 (20.1%)</td>
<td>721/2,230 (32.3%)</td>
<td>799/2,572 (31.1%)</td>
</tr>
<tr>
<td>Medication administration record</td>
<td>59/511 (11.5%)</td>
<td>486/2,250 (21.6%)</td>
<td>527/2,600 (20.3%)</td>
</tr>
<tr>
<td>Policy</td>
<td>69/511 (13.5%)</td>
<td>229/2,248 (10.2%)</td>
<td>278/2,598 (10.7%)</td>
</tr>
<tr>
<td>Storage procedures</td>
<td>61/511 (11.9%)</td>
<td>582/2,250 (25.9%)</td>
<td>626/2,600 (24.1%)</td>
</tr>
</tbody>
</table>

Note. Center = assisted living center, more than 10 beds; Home = assisted living home, 3 to 10 beds; Rural = area with a population of less than 1 million people and no medical center within 25 miles; Urban = area with a population of greater than 1 million people or a medical center within 25 miles.

- Four facilities not included due to missing data.
- One facility not included due to missing data.
- *p < 0.05; **p < 0.001.

Tions for care plan were significantly different between centers and homes but were not significantly related to level of care or geographical location, with assisted living centers having more citations than assisted living homes.

The second research question, which focused on an analysis of the medication-related allegations, used the second dataset containing 781 complaint investigations from 234 facilities (13% of all facilities in the state). The number of complaint investigations per facility ranged from 1 to 20 with a mean of 3.34 (SD = 3.31). These 781 complaint investigations involved 1,558 total allegations with the number of allegations/complaint investigations ranging from 1 to 37 (mean = 2.00, SD = 2.24). For 217 allegations, insufficient information was available to determine the identity of the victim. A total of 939 (60.3%) involved individual residents, 382 (24.5%) involved multiple residents, and 20 (1.3%) involved residents’ family members. Among the 939 involving individual residents, 683 individuals were involved in one allegation, and 256 were involved in more than one.

To answer the second research question, the analysis focused on substantiated and unsubstantiated medication-related allegations and the relationship of substantiated medication-related allegations to facility characteristics. Among the 939 allegations involving individual residents, 237 (25.2%) were medication related. Of these, 158 (69%) were substantiated. For residents involved in substantiated allegations, 20 (12.3%) experienced physical deterioration, 19 (11.7%) had a hospital admission, 15 (9.3%) experienced mental deterioration, 14 (8.6%) were sent to the emergency department, and 8 (4.9%) died as a result of the incident. Having a substantiated medication-related allegation was significantly more frequent in assisted living homes (3 to 10 beds) versus assisted living centers (more than 10 beds) (χ² = 4.589, df = 1, p = 0.02) (Table 4) and among facilities licensed for personal care services (χ² = 8.454, df = 2, p = 0.01) (Table 5) versus those licensed for directed care or supervisory care services. There were no urban versus rural differences.

The third research question related to describing, through selected examples from the narrative reports, the kind of problems involved. Narrative reports were reviewed, and data were sorted into the predetermined categories of: (a) administering medications without written prescriptions, (b) misuse of as-needed medications, (c) missing dosages, (d) wrong dosages, and (e) wrong medication. Examples were chosen because they represented what appeared to be common occurrences.

Administering medications without written prescriptions was a com-
mon problem. Often, many different drugs were involved for a single resident. For example:

The record showed no physician’s orders for the following medications which are listed on the August Medication Administration Record (MAR), signed as being given and are on hand: Toprol-XL® 100 mg 1 tab daily PO [by mouth], Lomotil® 75 mg 2 tabs QID [four times per day] PO, Flomax® 0.4 mg 1 cap daily PO, Cardizen®/Cartia® 120 mg 1 cap daily PO, Ambien® 10 mg 1 tab at bedtime PO, albuterol 1 unit dose 2 times daily PO, K-du® [potassium chloride] 20 mg 1 tab 2 times daily PO, Advair® 1 puff 2 times daily PO, Crestor® 10 mg 1 tab daily PO, aspirin 81 mg 1 tab daily PO, isosorbide/Imdur® 30 mg 1 tab daily PO, Diovan® 320 mg 1 tab daily PO, and furosemide 40 mg 1 tab daily PO.

Mistuse of as-needed medications was also common. For example:

Based on record review, the resident’s file contained a medication order for oxycodone and senna to be given PRN [as needed], however, a review of the MAR showed that these medications have been given on a daily basis in the past 3 months.

Missing dosages also occurred frequently, although it was sometimes difficult to tell whether the problem was actually missed dosages or failure to record dosages on the MAR. In some cases, however, the text made clear that the problem was missed dosages, for example, in incidences when the medication was unavailable or when missed dosages were related to residents refusing medications. On several occasions, it was clear that resident refusals had not been communicated to the primary care provider. Several incidences of adverse health events were related to missed dosages. For example:

The resident did not receive the Procrit® as ordered. This medication was to be given every 3 weeks. Personnel in the hematologist’s office explained Procrit is used to help build red blood cells. This resident has anemia related to a blood disorder. When this resident was seen in the physician’s office, the hematocrit was within the therapeutic range of 36-40. When the resident was seen in March, the hematocrit had dropped to 24.

Wrong dosages were less common than other problems, but when they did occur, they were almost always related to the large number of medications managed by the staff and to very complicated medication regimens. The following are two examples related to complicated regimens managed by the unlicensed personnel:

Example 1. The file contained a written order for insulin to be given daily. Additionally, there was documentation of a sliding scale for additional insulin to be given if the blood sugar level is above 150. The sliding scale is 151-200 = 2 cc; 201-250 = 5 cc; 251-300 = 7 cc; 301-350 = 9 cc; greater than 351 = 15 cc. In review of the blood sugar charts, the blood sugar level exceeded 150 on several occasions; however, there was no documentation of the amounts of insulin units given when this occurred.

Example 2: The record contains a written order for furosemide, 1 tab if blood pressure is lower than 110/60 and 2 tabs if blood pressure is over 110/60. The record does not include a blood pressure log for 4/13, 4/14, 4/15, 4/16, 4/17, the log starts 4/18 and the blood pressure is logged 132/89 and on 4/19 the blood pressure is logged as 163/70 but the MAR is signed as only giving 1 tab versus 2 tabs on 4/18 and 4/19.

Wrong medication was a relatively infrequent occurrence. However, when it occurred, the consequences were severe. For example:

When she [the resident] was admitted, her husband was also admitted…. When the son requested to review the list of medications, it was determined that she had been taking the medications that were prescribed for her husband since acceptance into the center. She died in December. The autopsy report stated: “The cause of death was due to complications of subdural hematomas due to inadver-
tent administration of warfarin with hypertension and dementia as contributing conditions.”

**DISCUSSION**

These qualitative examples show the kinds of problems documented in the files. Coupled with the quantitative data that show significant health consequences of the same incidents, ranging from physical deterioration (12.3%) to death (4.9%), they provide a clear picture that suggests severe problems, which given the aging demographics and increasing acuity in ALFs, does not promise to improve.

Few studies have evaluated the safety of medication administration using the unlicensed assistive personnel model, and estimates of error rates are few. With direct observation, Young et al. (2008) found a medication error rate of 8.2%, excluding errors related to medication timing. The current study found that medication-related citations constituted 18.4% of all citations given during a 2-year period. Although these “rates” are not really comparable because the data sources are different and the range of possible errors is larger in the current study, both studies suggest that errors are a significant problem among unlicensed personnel in ALFs. In addition, the fact that citations for medication administration, recording, and storage procedures violations were significantly more frequent in small facilities (assisted living homes) that employed unlicensed assistive personnel exclusively suggests the need to conduct more extensive evaluations of the safety of the unlicensed assistive personnel model.

Several high-risk drugs, such as warfarin, furosemide, and insulin, resulted in negative health consequences in Young et al.’s (2008) study. The narrative data analyzed in this study also identified problems associated with these high-risk drugs. Hansen et al. (2006) found a high medication error rate in nursing home residents that disproportionately included central nervous system agents (16%) such as benzodiazepines and analgesic drugs (11%). Given a similar resident profile in ALFs and nursing homes, it is likely the 18.4% medication-related citation rate in the current study may be due in part to similar issues involving potentially potent and harmful medications. This is also suggested because many of the citations involved misuse of as-needed medications (i.e., using drugs such as benzodiazepines and analgesic agents on a regular basis). It is probably unreasonable to expect unlicensed assistive personnel, who have little knowledge of both disease processes and the reasons for administering medications, to have good judgment about when to administer or withhold as-needed medications. In addition, substantiated medication-related complaints were significantly more frequent in assisted living homes (3 to 10 beds), the setting where professional staff are consistently unavailable. This is further evidence that the safety of the unlicensed assistive personnel model needs closer examination.

In addition to providing some evaluation data about the safety of the unlicensed assistive personnel model, these results exemplify other important issues regarding medication-related problems in ALFs. First is the manner in which data are collected and reported, which varies considerably from one state to another. From a national perspective, there is currently no easy or uniform way to determine the scope of medication-related problems in ALFs. Data in this study were drawn from regulatory information publicly available from ADHS. Because of Arizona regulations, it was possible to include ALFs of all sizes. However, in many states, small facilities are not licensed nor inspected. In addition, narrative data may not be customarily assessable, particularly for unsubstantiated complaints. Thus, a great deal of data is simply lost, including the identity and educational levels of the staff involved. It is also important to know that while available, the data used in this study had many limitations including missing data and difficulties in performing the content analysis with allegations embedded in complaints and residents embedded in allegations and complaints. Deciphering and coding the data was arduous and time consuming, and while the data are as accurate as humanly possible, they still might to some degree under- or over-represent some of the problems described.

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**KEYPOINTS**


1. Assisted living facilities (ALFs) were originally designed to serve a specific group of older adults with very stable health problems and simple care requirements.

2. However, caring for older adults with unstable and complex health care needs in ALFs has become increasingly common.

3. The unlicensed assistive personnel model of care delivery is used in ALFs across the country, but few studies have evaluated the safety of the model with regard to medication management.

4. More nursing oversight is critically needed to ensure the health and safety of ALF residents.
Another equally important issue is the great variability in state requirements for medication education of unlicensed personnel. Currently, all 50 states, as well as the District of Columbia, require orientation (initial training) and ongoing yearly training for unlicensed assistive personnel. However, only 14 (27.5%) states specify the number of general training hours, which ranges from 3 to 62. Only 20 states (39.2%) specify hours of medication training that varies between 3 (Nebraska) and 68 (Virginia); and only 7 (13.7%) require a specific training course for medication assistance. Nine states (17.6%) require a medication-related examination or certificate before unlicensed assistive personnel may assist with medication administration. However, only 1 state requires 3 hours of continuing education for medications, in addition to ongoing general training (National Center for Assisted Living, 2008).

Complicating the picture are the different and vague definitions of medication administration and medication assistance among states. Thirty-five states (68.6%) permit unlicensed personnel to assist in medication administration but do not define medication assistance. All of the regulations vary by state, level of care, and level of facility. Thus, it is difficult not only to obtain and compare data among states, but also to interpret the data in light of varying levels of training and regulation.

Two issues must be addressed to adequately evaluate the safety of unlicensed personnel related to medication management in ALFs. First is the lack of a central and consistent reporting mechanism. This deficit makes it difficult to ascertain the true extent of the problem. One model for this reporting may be the kind required for a critical incident report (who, where, what, when) submitted to a national central repository. Second is the ignorance of prescribers about the capabilities and education-al levels of unlicensed assistive personnel. Such ignorance was reflected in the complex medication regimens ordered by some prescribers in this study. Some medication regimens described in the narrative reports, such as graduated dosages of insulin administered based on blood glucose levels, would have been complex in any setting, let alone in unstructured settings such as ALFs where the majority of those who manage the medications have little or no health care background or specific training. These kinds of prescribing practices are simply asking for trouble. The safety of the unlicensed personnel model can never be fairly evaluated until providers learn to simplify prescriptions so they can be understood by unlicensed personnel and ALF owners/managers.

**IMPLICATIONS**

Drawing nursing implications from the findings of this study is difficult because, in reality, nurses nationwide have very little oversight for the care provided in ALFs or the performance of unlicensed assistive personnel. At one level, one might suggest that nurses in hospitals have an advocacy role so hospitalized older adults are not discharged to inappropriate levels of long-term care. One might also suggest nurses have roles in raising the index of suspicion about the likelihood of adverse drug events when ALF residents visit the emergency department, in educating other care providers about the limitations of allowing unlicensed personnel to administer medications, and in monitoring, to the degree possible, that prescriptions given to ALF residents in ambulatory care settings are simple and understandable.

At another level, however, how medication administration should be handled in ALFs needs to be addressed nationally. Solutions to date have included the use of medication technicians, physician-delegated caregivers (such as in Arizona), and nurse-delegated unlicensed assistive personnel (Reinhard et al., 2006; Spellbring & Ryan, 2003). All of these options are fraught with problems as medication administration involves high-level assessment skills in addition to the simple psychomotor skills of “giving pills.”

**SUMMARY**

ALFs were originally designed to serve a specific group of older adults with very stable health problems and simple care requirements. However, the climate has changed, and caring for older adults with unstable and complex health care needs in ALFs has become increasingly common. More nursing oversight in meeting the care needs of residents in facilities of all sizes is critically needed to ensure the health and safety of the new generation of ALF residents.

**REFERENCES**


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ABOUT THE AUTHORS
Dr. Woods is Assistant Professor, Dr. Guo is Postdoctoral Scholar, Ms. Kim is a doctoral student, and Dr. Phillips is Professor and Audrienne H. Mosesley Endowed Chair in Nursing, University of California Los Angeles, School of Nursing, Los Angeles, California.

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Address correspondence to Diana Lynn Woods, PhD, GNP, RN, Assistant Professor, University of California Los Angeles, School of Nursing, 700 Tiverton Avenue, Box 956919, Los Angeles, CA 90095-6919; e-mail: lwoods@sonnet.ucla.edu.

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