A Multifaceted Intervention to Implement Guidelines Did Not Affect Hospitalization Rates for Nursing Home–Acquired Pneumonia

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Objective: Determine whether a comprehensive approach to implementing national consensus guidelines for nursing home–acquired pneumonia (NHAP) affected hospitalization rates.

Design: Quasi-experimental, mixed-methods, multifaceted, unblinded intervention trial.

Setting: Sixteen nursing homes (NHs) from 1 corporation: 8 in metropolitan Denver, CO; 8 in Kansas and Missouri during 3 influenza seasons, October to April 2004 to 2007.

Participants: Residents with 2 or more signs and symptoms of systemic lower respiratory tract infection (LRTI); NH staff and physicians were eligible.

Intervention: Multifaceted, including academic detailing to clinicians, within-facility nurse change agent, financial incentives, and nursing education.

Measurements: Subjects' NH medical records were reviewed for resident characteristics, disease severity, and care processes. Bivariate analysis compared hospitalization rates for subjects with stable and unstable vital signs between intervention and control NHs and time periods. Qualitative interviews were analyzed using content coding.

Results: Hospitalization rates for stable residents in both NH groups remained low throughout the study. Few critically ill subjects in the intervention NHs were hospitalized in either the baseline or intervention period. In control NHs, 8.7% of subjects with unstable vital signs were hospitalized during the baseline and 33% in intervention year 2, but the difference was not statistically significant ($P = .10$). Interviews with nursing staff and leadership confirmed there were significant pressures for, and enablers of, avoiding hospitalization for treatment of acute infections.

Conclusions: Secular pressures to avoid hospitalization and the challenges of reaching NH physicians via academic detailing are likely responsible for the lack of intervention effect on hospitalization rates for critically ill NH residents. **(J Am Med Dir Assoc 2011; 12: 499–507)**

Keywords: Nursing home; pneumonia; hospitalization; guidelines; care processes

Pneumonia is the most important, common, potentially serious acute illness that affects nursing home (NH) residents. Median reported incidence is 1 per 1000 patient-days.[1] Respiratory disease causes 21.6% of admissions from NHs to acute care hospitals.[2] Between 21% and 46% of incident NHAP results in hospitalization.[3,4] The mean daily cost of a nursing home–acquired pneumonia (NHAP) hospitalization has been estimated at $420, but only $138/day for treating a similar episode in the NH.[5]

In 2006, Loeb and colleagues[6] demonstrated that a clinical pathway implemented by research nurses for NH-based treatment of pneumonia and other lower respiratory tract infections (LRTIs) in Canada reduced hospitalizations by 12%, without affecting mortality, functional status, or health-related quality of life. The current study was designed to determine whether a similar clinical pathway based on a nationally promulgated set of evidence-based guidelines,[7] implemented by NH nurses and physicians rather than research nurses, would have a similar impact on care processes.

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The guidelines implemented in this study recommend that the following vital sign criteria guide hospitalization: oxygen saturation less than 90% on room air at sea level; systolic blood pressure lower than 90 mm Hg or 20 mm Hg less than baseline; respiratory rate greater than 30 breaths per minute or 10 breaths per minute more than baseline; requiring oxygen at 3 liters per minute more than baseline; uncontrolled chronic obstructive pulmonary disease (COPD), congestive heart failure (CHF), or diabetes mellitus; unarousable if previously conscious; or new or increased agitation. Residents with none of these should remain in the NH for care; residents with 2 or more should be hospitalized, unless they have expressed a desire for no hospitalization. For residents with 1 of these critical vital signs, the decision to hospitalize should be based on the NH's ability to provide (1) vital sign assessment every 4 hours, (2) laboratory access, (3) parenteral hydration, and (3) at least 2 licensed nurses in the facility at all times.[7]

A multifaceted guideline implementation process based on Rogers' theory of innovation diffusion[8] was designed to address decisions made by physicians, certified nurse assistants (CNAs), and nurses involved in caring for an NH resident with NHAP. The combination of academic detailing to clinicians, within-facility nurse change agent, financial incentives, and nursing education had yielded improvements in care processes in 2 pilot tests.[9,10] We hypothesized that the intervention would decrease inappropriate hospitalization of residents with stable vital signs and increase appropriate hospitalization of critically ill residents at intervention sites, compared with baseline rates and compared with the control NHs.

METHODS

Overview

This mixed-methods, quasi-experimental, unblinded study tested the effects of a multidisciplinary intervention implementing national evidence-based guidelines on care for NHAP. The multifaceted intervention included (1) institutional change to facilitate immunization and the availability of appropriate testing and treatment; (2) interactive educational sessions to improve vaccination rates and nursing assessment skills; (3) a study liaison nurse who worked for the facility and who agreed to act as the change agent; and (4) academic detailing to physicians to impact diagnostic and prescribing practices.

Setting

Sixteen NHs that are members of one multifacility corporation were invited to participate in the study. The corporation was selected because it has NHs in many states and a reputation for delivering high-quality care. Eight homes are located in the Denver, Colorado, metropolitan area, and 8 homes are located in Kansas and Missouri. Denver-area homes received the intervention; homes in Kansas and Missouri served as controls. Baseline data were collected during influenza season, October to April 2004 to 2005; the intervention was conducted during the 2005 to 2006 and 2006 to 2007 influenza seasons. Both intervention and control facilities were paid $1000 per year to help cover the costs of lost work time from project activities. Details of subject recruitment and data collection have been reported elsewhere[11] and are summarized below.

Subjects

The intervention was conducted at the facility level, but individual NH residents with LRTI were enrolled in the study so that study personnel could review their NH medical records. NH residents in the study facilities who developed 2 or more signs and symptoms of LRTI were eligible. Eligibility was based on LRTI, rather than pneumonia, because pneumonia requires the presence of an infiltrate on chest x-ray, and many episodes of NHAP are treated without a chest x-ray being obtained.[12] Illness onset was defined as the first mention in the medical record of 2 or more LRTI signs and symptoms, at least 1 of which was respiratory. Residents who refused to consent to the chart review, who had been in the facility less than 5 days, or whom the charge nurse believed to be within 48 hours of dying were excluded. HIPAA authorization and informed consent were elicited from all subjects, or if they were not competent to consent, from their proxy health care decision-maker. Information about staffing, turnover, and staff vaccination rates was collected from the director of nursing (DON) at each facility once each year.[11] The Colorado Multiple Institutional Review Board approved the study (COMIRB #03–1243), and the corporation's 2 respective divisional offices provided Federal Wide Assurances for the Protection of Human Subjects.

Data Collection Protocol

Data collection methods have been previously reported in greater detail.[11] Briefly, resident and NHAP characteristics, comorbidity, and process of care data were gathered weekly during 3 influenza seasons, October through April 2004 to 2005, 2005 to 2006, and 2006 to 2007, by 6 nurse data collectors who were trained and employed by the study, using a previously tested, systematic chart review instrument on laptop computers in Microsoft Access 2000 with built-in range and logic checks.[9] Process of care data (including acute illness onset; physician notification and call-back times; antibiotics, time ordered and dispensed; and orders for hospitalization) were gathered from nurse and physician notes, orders, Medication Administration Records (MAR), and the Minimum Data Set (MDS) closest to illness onset. Charts were reviewed again 60 days later to ascertain hospitalization and survival. Every tenth chart was re-reviewed by the project manager and another data collector to ensure reliable data extraction. Only items with inter-rater reliability scores of 0.7 or better by Cohen's Kappa or percent agreement are reported here. The DON at each facility completed the facility questionnaire as previously described.[11]

Data from both the chart abstraction protocol and facility questionnaire were combined into an analytic file matched at the patient-case (episode) level for analysis using the SAS and Stata statistical software packages. A guideline adherence variable was created for each guideline, specifying the parameters by which an episode was considered to be in

compliance. Following the multifaceted intervention described in the following section, a qualitative descriptive study was undertaken to better understand the successes, challenges, and barriers to the study intervention, as previously described.[13]

MULTIFACETED INTERVENTION

Following baseline data collection, the multidisciplinary research team met with the medical directors and DONs or assistant DONs of the 8 intervention sites as a group to review our previous experience with implementing the guidelines,[9,10] discuss the antibiotic treatment and hospitalization recommendations in detail, and present the baseline data. Minor revisions were made to the implementation protocol, adapting it to circumstances at the intervention homes. The implementation was multifaceted, including institutional, nursing, and physician interventions.

Physician Facet

One of 3 pharmacists with expertise in geriatrics and infectious disease or the principal investigator, a geriatrician, met individually or in small groups with the medical director, physicians, and mid-level care providers (nurse practitioners and physician assistants) who attended to 4 or more residents at the intervention facilities. A member of the academic detailing team discussed the rationale for antibiotic, hospitalization, and diagnostic work-up guidelines during a scheduled 10- to 15-minute visit early in the first intervention year at times and locations convenient to the physicians and mid-level providers. They also provided laminated pocket copies of the care pathway, preprinted orders, and reprints. Follow-up telephone calls were made 3 months after the initial visit and at the beginning of the second intervention year. In spite of general support from the intervention NH medical directors, some physicians were reluctant to meet with study pharmacists. The research plan called for 2 in-person visits with the physicians and mid-level care providers who cared for most of the residents in the intervention homes in each intervention year, but many providers and physicians were only willing to meet in person at the beginning of the intervention. Subsequent discussions with those physicians and mid-level providers were therefore conducted by telephone. There were also some providers who would meet only with the principal investigator and were unwilling to meet with the study pharmacists.

Institutional and Nursing Facets

Briefly, the intervention facilities were paid an additional $1000 each year during the 2 intervention years to incentivize guideline compliance and early detection of LRTI signs and symptoms. The homes identified a study liaison nurse who was the facility's change agent for the study. The liaison nurse was responsible for helping to develop and present quarterly staff development sessions on respiratory illness, troubleshooting intervention implementation, and encouraging other nurses to use, and to remind the physicians to use, the guidelines. The liaison nurse was not responsible for data collection. Just before each intervention data collection period (October–April, years 2 and 3), the research team's nurse educator investigator (K.O.) and study liaison nurse cotaught a staff development conference for licensed nurses (registered nurses and licensed practical nurses) and nurse aides at a regular mandatory staff meeting, convenient to both day and evening staff in each facility. The NHAP guidelines and recognition of respiratory illness in residents were discussed, and preprinted NHAP orders (see Appendix 1) were introduced and distributed. The study liaison nurse repeated this staff development conference quarterly, at times convenient to all staff. Nursing staff were asked to remind physicians and mid-level practitioners to use the care pathway to guide treatment when they called to report residents with LRTI symptoms, and to remind physicians of the availability of preprinted NHAP orders, which included hospitalization orders for critically ill residents.

Analysis

The outcome variables of interest for this study were (1) the percentage of subjects having no vital sign indications for hospitalization who were treated in the NH, and (2) the percentage of subjects having either 2 or more vital sign criteria for hospitalization or 1 vital sign criterion plus evidence that the NH was not capable of providing acute care, who were transferred to the hospital or emergency department for evaluation and treatment.[7] The study was designed to have an 80% power to detect a 15 percentage point difference in adherence to a single guideline with an alpha of 0.05.

Demographics, functional status, comorbidities, LRTI severity, and care processes for residents who acquired LRTI were compared between the intervention and control homes during the intervention years, as previously described.[14]

Each of the hospitalization guidelines was applied to the data, and the percent compliance was calculated for each facility's episodes. Cases from the 8 intervention sites were then pooled, as were all cases in the 8 comparison sites. The chi-square test or Fisher exact test for dichotomous and *t* test or Mann-Whitney *U* test for continuous independent variables were used to compare adherence to the guidelines from the intervention and control facilities' baseline period to the intervention period and between the intervention and control facilities during the intervention periods. Risk-adjusted models were fit for each hospitalization guideline. Transcripts from the qualitative interviews were analyzed using content coding and a qualitative descriptive data analytic process, as previously described.[14]

RESULTS

As seen in Table 1, subjects in the intervention and control facilities were mostly older women with similar degrees of cognitive impairment and illness severity. There were more African American subjects in the control homes and more Latina subjects in the intervention homes. Intervention home subjects were more functionally impaired, and were more likely to have COPD and an order limiting aggressive care (DNR orders). NH size was similar, but staff turnover

Table 1. *Comparison of Intervention and Control Subjects and Nursing Homes—All Study Years*

	Intervention Homes (n = 549)	Control Homes (n = 574)	*P* value
Demographics			
Average age	83.4	83.5	.77
% Female	72.1	70.5	.60
% Latino	3.3	0.9	.0053
% African American	4.2	15.7	<.0001
% Receiving subacute care	24.4	19.2	.04
Comorbidity			
% with CHF	31.2	28.9	.43
% with COPD	26.8	21.3	.04
Functional status			
% Who eat independently	33.80	46.88	.0001
Mean Barthel Score	27.7	35.8	<.0001
Mean Cognitive Performance Score (0–6)	2.4	2.3	.31
Mean NHAP severity score (0–5)	0.77	0.72	.21
% with resuscitation status = DNR	75.3	60.6	<.0001
Average facility bed size	134.3	128.0	.80
% Annual nursing staff turnover	36.81	108.68	<.0001
Nurse/Resident hours per resident day	3.17	2.60	<.0001
Percent subjects on subacute (Medicare Part A) unit	19.16	24.41	.0358

CHF, congestive heart failure; COPD, chronic obstructive pulmonary disease; CPS, Cognitive Performance Score; DNR, do not resuscitate; NHAP, nursing home–acquired pneumonia.

was higher in every study year in the control homes. Only 799 (71%) episodes had a complete set of vital signs recorded at illness onset, limiting the subsample for which hospitalization guideline adherence could be evaluated. This was more often a problem in the control sites, where only 53.4% of episodes in the baseline year and 64.0% in the second intervention year had a full set of vital signs ($P = .013$). In the intervention sites, a full set of vital signs in the medical record at illness onset began and remained at about 83%. Overall mortality was 8.64%, and was not significantly different between intervention and control sites, across study years, or between those hospitalized and those treated in the NH after stratification by illness severity.

The impact of the multifaceted guideline implementation process on hospitalization decisions can be seen in Figures 1 and 2. Hospitalization rates did not change significantly in either the intervention or the control homes (intervention homes: 16.1% baseline versus 13.6% intervention period, $P = .55$; control homes: 22.6% baseline versus 23.0% intervention period, $P = 1.00$).

Adherence to Guideline for Treating Stable Residents in the NH

At baseline, compliance with the guideline that recommends remaining in the NH for treatment if the resident has stable vital signs was significantly greater in the intervention than control homes (see Figure 1); it remained very high throughout the study. In the control homes compliance was also high and did not change significantly between baseline and intervention (84.2 versus 89.7, $P = .67$). In multivariate modeling with hospitalization as the outcome, being in an intervention home during the intervention years did not enter the model (analysis not shown).

Adherence to Guideline for Transferring Unstable Residents to the Hospital

Baseline compliance with the guidelines recommending hospitalization for critically ill residents was poor in both intervention and control homes. There was no significant change in compliance with that guideline in the intervention homes between baseline and intervention. The compliance rate in the control facilities was 8.7% during the baseline and 33.0% in intervention year 2, but the difference was not statistically significant ($P = .10$). Again, in multivariate modeling being in an intervention home during the intervention years did not enter the model (analysis not shown).

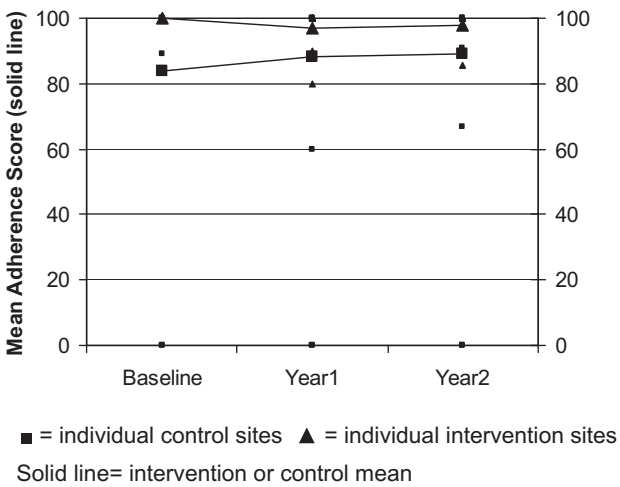

Fig. 1. *Mean adherence to guideline for treating stable residents in the nursing home.*

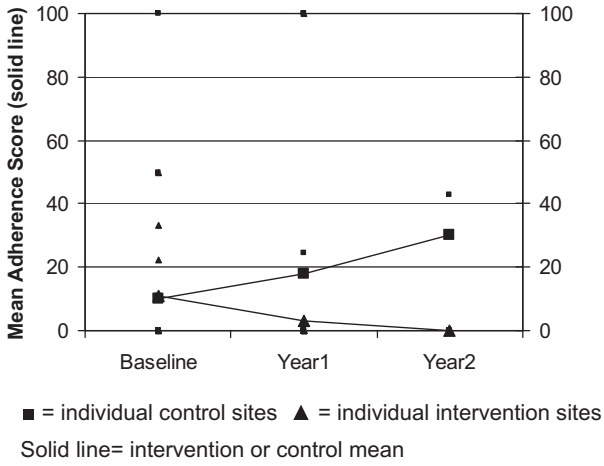

Fig. 2. *Mean adherence to guidelines for hospitalizing critically ill residents by individual site.*

Qualitative Findings

Interviews with NH nursing leadership and staff in many of the homes confirmed that more residents in both control and intervention homes are being treated in the NH with intravenous antibiotics. Interviewees cited several reasons for this trend: (1) Nurse practitioners are present in many facilities on a daily basis, and physicians visit more frequently. However, there did not appear to be a relationship between facility hospitalization guideline compliance rates and this comment from the interviewees. (2) Residents and their families prefer that the resident remain in the facility with staff who are familiar with their physical and psychosocial needs. (3) Preprinted orders and physician-driven protocols are available to guide antibiotic administration and monitoring parameters. (4) Because many of the facilities are now caring for acutely ill residents who are coming from the hospital with pneumonia, the facility staff is aware of and comfortable providing care for these residents. The Corporate Division nurse leadership used several strategies to inform physicians about the nursing staff's ability to care for residents with pneumonia. They provided the physicians and practitioners with information sheets and education about staff's capabilities and intravenous (IV) antibiotic availability. They also said that they were actively working to better inform and regularly update attending physicians about the residents' conditions.

One of the intervention NH liaison nurses shared, "I think some of the physicians and NH staff felt like the transition to a different care environment was detrimental in and of itself and wasn't superseded by the care they would have gotten, you know, for IVs and antibiotics. In essence, they wanted to keep the residents in the facility because they felt we could do a good job caring for them."

Another intervention home nurse liaison believed that, "Education empowers staff to take care of them (residents) in the facility. Staff were more likely to provide better answers to the families so that the family wasn't demanding that they provide quicker treatment. I mean, if you're doing an x-ray and getting them on antibiotics immediately, they're better, you know. They don't need to go out (to the hospital). If it goes unnoticed because nobody is paying attention, then they're septic and they have to go out."

Similarly, a control home DON shared, "We've had 2 nurse practitioners in every day, and so when we see somebody sick we tell them and we document the problem, we take care of the problem and the next thing you know they're on antibiotics."

Another control home DON believed that she kept more residents with pneumonia in the NH rather than transferring them for inpatient care, "If we can treat the resident in-house, it's a lot better for them versus sending them to the hospital and changing their environment. No, we keep more than we send."

Reaction of the intervention homes' nursing leadership to the introduction of preprinted orders was mixed. Personnel at half the facilities either didn't use them very often or said they didn't work, whereas at the other 4 homes the nurses reported that they worked well and may have made a difference in how physicians treated pneumonia. Some of the liaison nurses used an NCR (no carbon required) copy of the orders as a way to track and reward nurse and CNA early detection of LRTI symptoms. In those homes the preprinted orders found their way onto resident charts and were more likely to be viewed as useful by the facilities.

DISCUSSION

This multifaceted implementation of comprehensive guidelines for managing NHAP had no impact on hospitalization decisions made by attending physicians and mid-level providers at the intervention homes. The intervention did improve staff vaccination rates[14] and some aspects of antibiotic use,[15] but not the venue of care. There are several possible reasons for this.

First, a high percentage of cases were already being appropriately treated in the NH. This finding contrasts sharply with previous reports.[3,4,6] Whether it represents a true national change from the mid-1990s, or peculiarities of the nursing home corporation and/or states involved in this study is not clear. Even the most recent national study of NHAP hospitalization rates analyzed data from 1996.[16] The qualitative component of this study revealed that there were significant pressures for, and enablers of, keeping residents in NHs for treatment of acute infections in both intervention and control homes during all study years. Increased availability of nurse practitioners and physicians who can evaluate acutely ill NH residents in a timely fashion is often cited as reducing hospitalization rates.[17] Overall however, hospitalization rates did not change in either the intervention or control sites during the 3 study years.

Second, the academic detailing part of the intervention was less successful in engaging physicians and mid-level care providers in following the care pathway than in other studies of academic detailing in NHs.[18–20] Those studies, however, were more narrowly focused on medication prescribing practices, whereas the detailing on this study covered the full spectrum of NHAP treatment, including immunization,

diagnostic studies, antibiotic prescribing, and hospitalization. Moreover, in spite of initial support from the medical directors at the intervention facilities and no official facility or corporate policies regarding hospitalization, one influential physician who is the medical director of an NH health maintenance organization (HMO) in the intervention region actively opposed the hospitalization guidelines.

Third, the mixed response of intervention NHs to the innovation of preprinted orders, which among other things, outlines the hospitalization guidelines, likely also contributed to the failure of this part of the intervention. Except for admitting order templates, preprinted orders are unusual in NHs. Whether they were used in intervention homes likely depended on the persuasive strength of the liaison nurse.

The key difference between this study and that conducted by Loeb and colleagues[6] in Ontario, Canada, is that whereas Loeb and colleagues employed research nurses to implement a care pathway, we attempted to elicit guideline compliance from the nurses and physicians working in the homes we studied. Baseline hospitalization rates in our intervention facilities were close to the 10% level obtained by Loeb and colleagues[6] during their intervention.

The study's strengths include its multistate, multifacility focus, prospective data collection, and comprehensive approach to improving care for NHAP. The study has a number of important limitations. First, there were significant differences between intervention and control homes in baseline guideline compliance, subject characteristics, and facility characteristics, including nursing resident staffing ratios, and nursing staff turnover.

Second, the appropriateness of nearly one third of the hospitalization decisions could not be evaluated because a full set of vital signs was not recorded at illness onset. This was particularly problematic in the control sites. Although it is therefore difficult to evaluate whether there were changes in hospitalization guideline compliance in the control facilities, it is clear that there was no change in the intervention homes. For the guideline "not to hospitalize stable residents" there was likely a ceiling effect of good adherence before the intervention. For the guideline "to hospitalize critically ill residents who desired hospitalization if indicated," the intervention had no impact.

Third, we interviewed only nursing personnel for the qualitative part of the study. Given that physicians and mid-level providers were difficult to engage in even one meeting during the intervention, we did not attempt to schedule extensive qualitative interviews with physicians and other providers at the end of the intervention. As a result, little is known about why some chose not to meet with study pharmacists and most chose not to follow the hospitalization guidelines.

Finally, the guidelines being implemented have not been validated as impacting function or mortality; the hospitalization guidelines, in particular, were rated C/III—poor evidence, based on opinions of respected authorities' clinical experience, descriptive studies, and reports of expert committees.[7] However, the study's recommended vital sign parameters for treating in the NH were very similar to those implemented by Loeb and colleagues,[6] who demonstrated no mortality or adverse functional outcome from their implementation. For the 107 episodes of critical illness in this study, there was no indication that mortality differed, based on hospitalization versus treatment in the NH, but the study was not powered to detect mortality outcomes.

Generalizability of the study is limited by use of homes from a single multifacility corporation. It is also possible that residents who consented to be in the study were different in ways we could not measure from residents with LRTIs who declined admission. However, it is highly unlikely that the intervention impacted hospitalization of residents not enrolled in the study.

This study highlights the difficulty of changing care provider behavior, particularly in the face of unclear evidence for the benefit of the behavioral change. In studies where academic detailing modified behavior,[18–20] both the evidence and regulatory pressures in favor of the change were stronger than in our study. Future studies should focus on (1) a rigorous evaluation of the risks and benefits of hospitalizing NH residents with pneumonia and (2) using qualitative studies of care providers to develop stronger interventions for changing provider behavior.

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APPENDIX 1

Preprinted orders

ORIGINAL COPY

PHYSICIAN/PRESCRIBER

PLEASE SIGN AND RETURN

☐ Send NO MEDS ☐ Send * MEDS ONLY

☐ Send ALL MEDS ☐ _____ Doses taken from Emergency/Backup Stock

Facility Name		Address		Signature of Nurse Receiving Order	Date/Time
Family Name	First Name	Admission Number	Room Number	Attending Physician	

Date Ordered	Time Ordered	Date DC'd	MEDICATION/Order Dose & Form Route Schedule	INDICATION – DX
			1. Patient has two or more symptoms and signs of possible pneumonia	Pneumonia
			2. Document vital signs and O2 Sat every shift until antibiotics complete/symptoms resolve	
			3. Call MD for O2 Sat ≤ 88% or ≥ 2 l increase in O2 to keep Sat >90%; SBP <90, RR>30, P>130	
			4. Ask whether resident/proxy desires hospitalization and aggressive care. Report to MD	
			5. **IF** MD **orders hospitalization/ER**, give **Rocephin 1G IM**, unless severely allergic to PCN	

Encourage hospitalization if pt has 2 or more: O2sat ≤ 88% or needs 3lpmO2>baseline, SBP<90, RR>30, newly unarousable or agitated

Physician/Prescriber Signature	Title	Date

NURSE: Please Initial The Documentation Record As Performed ☐ Read back and verified ☐ Family notified of change in condition

Pharmacy	On Physician's Order Sheet	Med Sheet	TX Sheet	Nurse's Notes	Patient Care Plan	ADL/Flow	Signed	Date	Time
☐ Courier ☐ Faxed (Fax Original) ☐ Phone									

ORIGINAL COPY

PHYSICIAN/PRESCRIBER

PLEASE SIGN AND RETURN

☐ Send NO MEDS ☐ Send * MEDS ONLY

☐ Send ALL MEDS ☐ _____ Doses taken from Emergency/Backup Stock

Facility Name		Address		Signature of Nurse Receiving Order	Date/Time
Family Name	First Name	Admission Number	Room Number	Attending Physician	

Date Ordered	Time Ordered	Date DC'd	MEDICATION/Order Dose & Form Route Schedule	INDICATION – DX
			IF patient NOT sent to hospital or ER, **order CXR to r/o infiltrate**	Pneumonia
			IF MD orders antibiotics, **see antibiotic choices below and**	
			☐ get 1 set of blood cultures (unless it will delay giving antibiotics)	
			☐ **IF** on Coumadin, PT/INR MWF while on antibiotics	

Immediate antibiotics encouraged if pt has: P>130 T>101.5, O2sat ≤ 88%, needs 3 lpm O2> baseline, SBP<90, RR>30, newly unarousable or agitated

Physician/Prescriber Signature	Title	Date

NURSE: Please Initial The Documentation Record As Performed ☐ Read back and verified ☐ Family notified of change in condition

Pharmacy	On Physician's Order Sheet	Med Sheet	TX Sheet	Nurse's Notes	Patient Care Plan	ADL/Flow	Signed	Date	Time
☐ Courier ☐ Faxed (Fax Original) ☐ Phone									

ORIGINAL COPY

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☐ Send NO MEDS ☐ Send * MEDS ONLY

☐ Send ALL MEDS ☐ ____ Doses taken from Emergency/Backup Stock

Facility Name	Address	Signature of Nurse Receiving Order	Date/Time
Family Name First Name	Admission Number / Room Number	Attending Physician	

Date Ordered	Time Ordered	Date DC'd	MEDICATION/Order Dose & Form Route Schedule	INDICATION – DX
			IF MD orders antibiotics, **choose ONE treatment option**, **give first dose STAT** *(oral is preferred)*: **Check Allergies**	Pneumonia
			☐ **Treatment 1:** Levaquin 500mg PO daily x 10 days	
			☐ **Treatment 2:** (if SCr >1.3): Levaquin 500mg day 1, then 250mg PO daily, days 2-10	
			☐ **Treatment 3:** Augmentin 875mg PO BID x 10 days **PLUS** Zithromax 500mg PO day 1, 250mg PO daily 2-5 days	
			☐ **Treatment 4:** Rocephin 1G IM daily until able to take PO, then call MD for PO antibiotic order	

Physician/Prescriber Signature	Title	Date

NURSE: Please Initial The Documentation Record As Performed ☐ Read back and verified ☐ Family notified of change in condition

Pharmacy	On Physician's Order Sheet	Med Sheet	TX Sheet	Nurse's Notes	Patient Care Plan	ADL/Flow	Signed	Date	Time
☐ Courier ☐ Faxed (Fax Original) ☐ Phone									