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Le lesioni da decubito.

Corrado Carabellese
Gruppo di Ricerca Geriatrica

Prevalenza in USA

Ospedale 10-18%

Long-term care 2.3-28%

Riabilitazione 0-27%

Home care 0-29%

Pazienti terminali 14-28%

(Cuddigam Adv Skin & Wond Care 2001)

Prevalenza in Lombardia

Lo studio della prevalenza in 68 Residenze Sanitarie Assistenziali in Lombardia ha riportato che il 10+/-8.1% degli ospiti era portatore di lesione da decubito di diverso grado.

Lo standard ottimale tra le RSA era pari al 14%.

(Sirchia G. TrabucchiM., Zanetti E. Tendenze Nuove, 2001)

Quality indicators for prevention and management of pressure ulcers in vulnerable elders.

Prevention and treatment of pressure ulcers are an important aspect of care for vulnerable elders.

This paper presents quality indicators for prevention and care of pressure ulcers among vulnerable elders and the evidence supporting these indicators.

The methods for devoloping these quality indicators, including literature review and expert panel consideration.

Of the potential 15 quality indicators, 10 were judged to be valid by expert panel.

(Barbara M., Ann Intern Med 2001)

Quality indicator 1 and 2 pressure ulcer prevention risk assessment.
(Barbara M., Ann Intern Med 2001)

IF a vulnerable elder is admitted to an intensive care unit or a medical or surgical unit of a hospital and cannot himself or herself or has limited ability to do so,

THEN risk assessment for pressure ulcers should be done on admission,

BECAUSE risk assessment can predict pressure ulcer formation in such high-risk groups and form the basis for intervention.

Quality indicator 1 and 2 pressure ulcer prevention risk assessment.
(Barbara M., Ann Intern Med 2001)

IF a vulnerable elder is identified as at risk,

THEN a preventive intervention addressing repositioning needs and pressure reduction (or management of tissue loads) must be instituted within 12 hours,

BECAUSE reduction or elimination of risk factors can prevent pressure ulcer formation.

Quality indicator 3 pressure ulcer prevention.
(Barbara M., Ann Intern Med 2001)

IF a vulnerable elder is identified as at risk and has malnutrition (involuntary weight loss of > 10% over 1 year or low albumin or prealbumin level),

THEN nutritional intervention or dietary consultation should be instituted,

BECAUSE poor diet, particulary low dietary protein intake is an indipendent predictor of pressure ulcer development.

Quality indicator 4 pressure ulcer evaluation.
(Barbara M., Ann Intern Med 2001)

IF a vulnerable elder present with a pressure ulcer,

THEN the pressure ulcer should be assessed for location, depth and stage, size, and presence of necrotic tissue,

BECAUSE baseline assessment guides interventions, provides data for later comparison to evaluate healing and can help predict time to healing.

Quality indicator 4 pressure ulcer evaluation.
(Barbara M., Ann Intern Med 2001)

Le lesioni di secondo grado mostrano una maggior possibilità di guarigione di 5.2 volte rispetto a quelle di quarto grado.

La valutazione della profondità della lesione è un predittore del tempo di guarigione.

La dimensione della superficie della lesione è un predittore del tempo di guarigione.

La riduzione della dimensione della superficie della lesione pari al 39% a due settimane è un predittore del tempo di guarigione.

La sostituzione del tessuto necrotico con quello di granulazione ed epiteliale è un indicatore di guarigione della lesione da decubito.

Quality indicator 5 and 6 management of full-thickness pressure ulcers.
(Barbara M., Ann Intern Med 2001)

IF a vulnerable elder present with a clean full-thickness pressure ulcer and has no improvement after 4 week of treatment,

THEN the appropriateness of the treatment plan and the presence of cellulitis or osteomyelitis should be assessed,

BECAUSE clean full-thickness pressure ulcers should show evidence healing or improvement within 4 week and lack of improvement should stimulate a change in approach.

Quality indicator 7 pressure ulcer debridement.
(Barbara M., Ann Intern Med 2001)

IF a vulnerable elder presents with a full-thickness sacral or trochanteric pressure ulcer covered with necrotic debris or eschar,

THEN debridement by using sharp, mechanical, enzymatic, or autlytic procedures should be done within 3 day of diagnosis,

BECAUSE dead tissue is a physical obstacle to healing tissue and provides a medium for bacterial invasion and proliferation, wich places the patient at high risk for wound infection.

Quality indicator 8 pressure ulcer management: cleansing.
(Barbara M., Ann Intern Med 2001)

IF a vulnerable elder has a stage 2 or greater pressure ulcer,

THEN a topical antiseptic should not be used or the wound,

BECAUSE topical antiseptic may harm the healty wound bed.

Quality indicator 9 and 10 pressure ulcer debridement for systemic infection.

(Barbara M., Ann Intern Med 2001)

IF a vulnerable elder with a full-thickness pressure ulcer present with systemic signs and symptoms of infection, such as elevated temperature, leukocytosis, confusion, and agitation, and these signs and symptoms do not have another identified cause,

THEN the ulcer should be debrided of necrotic tissue within 12 hours,

BECAUSE debridement will reduce dead tissue that provides a medium for bacterial invasion and may lead to systemic infection.

Quality indicator 9 and 10 pressure ulcer culture for systemic infection.
(Barbara M., Ann Intern Med 2001)

IF a vulnerable elder with a full-thickness pressure ulcer present with systemic signs and symptoms of infection, such as elevated temperature, leukocytosis, confusion, and agitation, and these signs and symptoms do not have another identified cause,

THEN a tissue biopsy or needle aspiration sample should be obtained and sent for culture and sensitivity testing within 12 hours,

BECAUSE high bacterial burdens inhibit wound healing and may lead to systemic infection, and needle aspiration or tissue biopsy is the best indicator of bacterial invasion into tissue.

Quality indicator 11 topical dressings.
(Barbara M., Ann Intern Med 2001)

IF a vulnerable elder present with a clean full-thickness or partial full-thickness pressure ulcer,

THEN a moist wound-healing environment should be provided with topical dressings,

BECAUSE wound heal better in a moist environment.

Factors which increase risk for pressure ulcers

- Age

- Inability to move certain parts of body without assitance, such as with spinal or brain injury patiens, and patients with neuromuscolar diseases.

- Malnourishment.

- Being bedridden or in a wheelchair.

- Having a chronic condition, such as diabetes or artery disease, that prevents areas of the body from receiving blood flow and nutrition.

- Urinary incontinence or bowel incontinence.

-Fragile skin.

- Disability from mental conditions.

Tabella 1: Distribuzione delle caratteristiche funzionali degli ospiti nuovi ammessi nell'anno 1995, 1996,1998, 1999 e 2000, 2001, 2002, 2004.

Parametri Funzionali	1995	1996	1998	1999	2000	2001	2002	2004
Nuovi ingressi			93	74	41	79	111	32
Età Media			82.7	84.4	84.3	84.7	83.6	83.9
Numero Schede	78	47	85	77	40	79	90	31
Funzioni Cognitive:								
Adeguate	28 (35.9)	10 (21.3)	32 (37.7)	21 (27.2)	13 (32.5)	32 (40.5)	23 (25.5)	5 (17.2)
Decadimento moderato	21 (26.9)	15 (31.9)	19 (22.3)	30 (39.0)	8 (20.0)	23 (29.1)	20 (22.2)	6 (20.7)
Decadimento severo	29 (37.2)	22 (46.8)	34 (40.0)	26 (33.8)	19 (47.5)	24 (30.3)	47 (52.2)	18 (68.1)
Deambulazione:								
Autonoma	25 (32.1)	14 (29.8)	27 (31.7)	20 (26.0)	9 (22.5)	24 (30.3)	26 (28.8)	6 (19.4)
Con aiuto	16 (20.5)	11 (23.4)	17 (20.0)	32 (41.5)	12 (30.0)	19 (24.0)	17 (18.8)	10 (32.3)
Non deambulante	37 (47.4)	22 (46.8)	41 (48.2)	25 (32.5)	19 (47.5)	36 (45.5)	47 (52.2)	15 (48.4)
Alimentazione:								
Autonoma	42 (53.8)	31 (65.9)	42 (49.4)	59 (76.7)	26 (65.0)	58 (73.4)	47 (52.2)	13 (41.9)
Con aiuto	17 (21.8)	3 (6.5)	20 (23.5)	7 (9.0)	7 (17.5)	5 (6.3)	16 (17.8)	8 (25.8)
Dipendente	19 (24.4)	13 (27.6)	18 (21.1)	11 (14.3)	7 (17.5)	16 (24.4)	27 (30.0)	10 (32.3)
Igiene:								
Autonoma	6 (7.7)	2 (4.2)	8 (9.4)	8 (10.4)	2 (5.0)	9 (7.7)	4 (4.4)	1 (3.2
Con aiuto	26 (33.3)	13 (27.6)	23 (27.0)	20 (25.9)	7 (17.5)	14 (33.3)	25 (27.8)	)
Dipendente	46 (59.0)	32 (68.1)	54 (63.5)	49 (63.6)	31 (77.5)	56 (59.0)	61 (67.8)	9 (29.0)
								21 (67.7)

Vestirsi:								
Autonomo	6 (7.7)	1 (2.2)	6 (7.0)	8 (10.4)	2 (5.0)	8 (7.7)	4 (4.4)	1 (3.2)
Con aiuto	17 (21.8)	8 (17.0)	19 (22.3)	14 (18.1)	8 (20.0)	11 (21.8)	22 (24.5)	9 (29.0)
Dipendente	55 (70.5)	38 (80.8)	61 (71.1)	54 (70.1)	30 (75.0)	55 (70.5)	64 (71.1)	21 (67.7)
Continenza:								
Incon. Urin/catetere	57 (73.1)	41 (87.2)	61 (71.7)	54 (70.1)	34 (85.0)	42 (53.1)	54 (60.0)	17 (54.8)
Continente	21 (26.9)	6 (12.8)	24 (28.2)	23 (29.9)	6 (15.0)	10 (12.6)	16 (17.8)	5 (16.1)
						27 (34.1)	20 (22.2)	9 (29.0)
Provenienza:								
Domicilio					17 (42.5)	27 (34.1)	31 (34.4)	9 (30.0)
Riabilitazione					7 (17.5)	17 (21.5)	30 (33.3)	9 (30.0)
Ospedale					5 (12.5)	12 (15.1)	18 (20.0)	7 (23.3)
Struttura Protetta					11 (27.5)	23 (29.1)	11 (12.2)	5 (16.7)
Lesioni cutanee:								
Si					6 (15.0)	13 (16.4)	10 (11.1)	3 (9.7)
No					34 (85.0)	66 (83.5)	80 (88.9)	28 (90.3)
Farmaci:								
Num. medio Osp.						4.0	3.9	4.6
Ospiti Senza Psicofar.						28 (36.8)	31 (37.4)	15 (55%)
Ospiti Con Psicofarma.						1.6	1.7	1.4

Tabella 1: incidenza delle lesione da decubito ed ulcere vascolari nelle unità operative anno 2001.

Ospiti con Lesioni da decubito	**Prima Unità Cdd 60 pl**	**Seconda Unità Cdd 60 pl**	**Terza Unità Cdd 60 pl**	**Quarta Unità cdd 60 pl**	**Prima Unità Luz 40 pl**	**Seconda unità Luz 80 pl**	**Totale 360 pl**
Secondo stadio	1	4	2	4	1	1	13 (3.9%)
Terzo e Quarto stadio	2	5	4	1	1	1	14 (4.1%)
% Ospiti Unità	3 (5%)	9 (15%)	6 (10%)	5 (8.3%)	2 (5%)	2 (2.5%)	27 (8.0%)

Tabella n.1: distribuzione delle prescrizioni mediche del sovramaterasso e compressore nelle U.O..

Unità/settore	Media Norton (Range)	Prescrizione Mat. antidecubito	Ospiti con Mat. e senza Lesione/i	Ospiti con Lesione/i senza Mat.	Ospiti con Lesione/i 1,2 e Mat. Antidecubito	Ospiti con Lesione/i 3,4 e Mat. Antidecubito
Prima Unità CDD	8.81 (6-12)	16/51	13		0	3
Seconda Unità CDD	8.33 (5-13)	15/59	8		4	3
Terza Unità CDD	10.04 (6-17)	25/61	17		3	5
Totale		**56/171 (32.7)**	**38 (24.8)**		**7 (4.1)**	**11 (6.4)**
Settore Verde LUZZ	10.0 (5-14)	18/58	13		3	2
Settore Giallo LUZZ	9.9 (6-14)	23/48	18		1	4
Settore Rosso LUZZ	9.33 (5-14)	15/48	9		5	1
Totale		**56/154 (36.3)**	**40 (28.9)**		**9 (5.8)**	**7 (4.5)**
Primo piano RES	6.0 (5-7)	2/39		- 1	1	2
Azzurro RES	6.5 (6-7)	3/28		- 2	3	2
Arancione RES	8.5 (6-12)	4/28	2			2
Totale		**9/95 (9.5)**	**2 (2.1)**	**- 3 (2.9)**	**4 (4.2)**	**6 (6.3)**
Totale Fondazione		**121 (28.8)**	**79 (19.0)**		**20 (4.8)**	**24 (5.7)**

Sign.ra PE di anni 84

Ingresso: 30.12.2005 proveniente da altra struttura protetta.

Storia di vita ed anamnesi sociale:

scolarità 5 anni, casalinga, vedova dal ’84, 2 figli viventi, ascolta la messa.

Viveva a casa con badante da diversi anni, nel luglio 2005 è stata ricoverata in reparto per acuti in seguito a “ictus cerebri” e trasferita in struttura protetta.

Viene inserita nelle attività di animazione compatibilmente con le condizioni cliniche.

Sign.ra PE di anni 84

An. Fisiologica: alvo diarroico, incontinenza fecale ed urinaria.
Alimentazione: cibi morbidi, edentulia, protesi superiore.
Mobilità: letto-carrozzina trasferita con sollevatore passivo.
Prescritte: spondine a letto e contenzione pelvica in carrozzina.

Es. Neurologico: Vigile, afasia, non disturbi del comportamento, facilmente distraibile, non movimenti involontari, postura seduta possibile con supporti, arti flaccidi con assenza di contrazione muscolare.

Decubito: decubito sacrale terzo grado secernete, cm 9x8x5.

Sign.ra PE di anni 84

Pregressi recenti ricoveri prima dell’ammissione in RSA:

Luglio 2005: Esiti di infarto cerebrale emisfero sx con emiplegia dx ed afasia globale. Hb 12.2 g/dl, Col. 149, SOF positivo,

Visita fisiatrica: non indicato trattamento riabilitativo,

TAC: In regione temporo-fronto-parietale sx area ipodensa circondata da edema riferibile a lesione ischemica recente. Marcata cortico atrofia.

Novembre 2005: Crisi comiziali generalizzate con stato post-critico prolungato. All’ingresso riscontro di grave ipopotassiemia. Dimessa con lesione da decubito.

Sign.ra PE di anni 84

Diagnosi all'ingresso:
Esiti di infarto cerebrale emisfero sx con emiplegia dx ed afasia globale,
Pregressa Radioterapia per K portio con peri-viscerite,
Bronchite cronica,
arteriopatia obliterante arti inferiori,
Crisi comiziali recidivanti,
Anemia multifattoriale,
Cardiopatia ischemica cronica,
Episodi anamnestici di FA parossistica e Bradicardia da ritmo giunzionale,
HCV+,
Pregressa pancreatite acuta secondaria a stenosi da scleroddite.

Terapia all'ingresso: Cardioaspirina 1 cpr, Gardenale 100 1 cpr, Luvion 100 1 cpr, Dilzene 120 1x3 cpr, Mepral 20 1 cpr, Serpax 15 1 cpr.

Sign.ra PE di anni 84

Esami laboratorio all'ingresso: HB 10.4 gr/dl, prot. Tot. 5.53, Alb. 38%, K 5.27.

Valutazione multidimensionale: Barthel 0/100, Norton 6/24 (rischio elevato), Tinetti 0/28, MMSE non somministrabile.

Valutazione fisioterapista: paziente dolorante, emiplegia dx flaccida, arto inferiore dx in atteggiamento di extrarotazione e piede supinato, totale ipotonia dx. Assente il controllo del tronco da seduta. Difficoltosa la comprensione. Si imposta correzione posturale sia in carrozzina che supina con arto superiore declive e arto inferiore allineato. E' necessario l'uso del sollevatore passivo per la mobilizzazione in carrozzella.

Sign.ra PE di anni 84
PIANO DI ASSISTENZA INDIVIDUALIZZATO (Genn. 06)

Problemi:
controllo frequenza cardiaca, Lesione da decubito sacrale 3° stadio, alvo diarroico, controllo elettroliti, controllo del peso, idratazione.

Obiettivi:
normalizzare la frequenza cardiaca, riduzione superficie lesione da decubito.

Interventi:
Controllo PA e FC, visita cardiologica.
Medicazione lesione da decubito, materassino ad aria, posizionamento a letto ogni due ore, movimentare dal letto 2 volte al di', controllo cute quotidiana, stimolare l'apporto alimentare ed idratare.

Sign.ra PE di anni 84
PIANO DI ASSISTENZA INDIVIDUALIZZATO (Apr. 06)

Problemi:
Lesione da decubito sacrale 3° stadio, alvo diarroico, controllo elettroliti,

Obiettivi:
riduzione superficie lesione da decubito.

Interventi:
Controllo PA e FC, Medicazione lesione da decubito, materassino ad aria, posizionamento a letto ogni due ore, movimentare dal letto 2 volte al di', controllo cute, stimolare l'apporto alimentare ed idratare.

Verifica risultati:
Normalizzazione frequenza cardiaca, lieve riduzione della superficie lesione, lieve incremento del peso, prot. Tot. 5.72, Alb. 43%,

Sign.ra PE di anni 84

Diario Clinico

Problemi all'ingresso: alvo diarroico, episodi di tachicardia.

Il **27.1.06** Infezione vie respiratorie trattata con antibiotico.

Nel mese di **Febbraio** si programma esame Holter e visita cardiologica con variazione terapia.

Nel mese di **Maggio** episodio di infezione vie respiratorie trattata antibiotico.

Sign.ra RM di anni 85

Ingresso: 11.4.2006 proveniente da altra struttura protetta.

Storia di vita ed anamnesi sociale: scolarità 8 anni, sarta, sposata, 1 figlia vivente, praticante la religione cattolica.

Viveva a casa con marito e seguiti dalla figlia. Recentemente ripetuti ricoveri ospedalieri con inserimento in struttura protetta.

Sign.ra RM di anni 85

Alimentazione: disfagia ai liquidi e solidi, edentulia, protesi non disponibile.
Mobilità: letto-carrozzina e trasferita con sollevatore passivo.
Es. Neurologico: Non collaborante, stato soporoso.

Decubiti: decubito sacrale terzo grado poco secernente e cm 5x4x3, decubito ai talloni dx e sx.

Sign.ra RM di anni 85

Pregressi recenti ricoveri prima dell'ammissione in RSA:

Febbraio 2006: Esiti di endoprotesi anca sx per frattura femore in M. di Alzheimer. Durante il ricovero trattata per broncopolmonite sx e scompenso cardiaco ed insufficienza respiratoria transitoria. Presenta decubiti ai talloni e al sacro. GB 12.43 Hb 8.2 g/dl, Prot tot. 5.3 gr, Alb. 43%,

Marzo 2006: Ulcere da decubito sacrale e talloni. Demenza di Alzheimer di grado evoluto. Sindrome ipocinetica.
GB 7.8 Hb 11.3 g/dl, Prot tot. 7.6 gr, Alb. 49%,

Aprile 2006 (RSA): infezione vie respiratorie con prescrizione antibiotica. La scheda assistenziale riporta disfagia e la paziente è alimentata con cibi frullati attraverso siringa.

Sign.ra RM di anni 85

Diagnosi all’ingresso:

Esiti di recente frattura femore sx trattata con endoprotesi.
Malattia di Alzheimer.
Sindrome ipocinetica.
Anemia multifattoriale.
Intercorrente broncopolmonite sx.
Parkinsonismo secondario.

Terapia all’ingresso: Cardioaspirina 1 cpr, Lasitone 1 cpr. Laevolac. Rocefin 2 gr. Ev. Aerosol Clenil e Broncovaleas x 3 al di’.

Sign.ra RM di anni 85

Esami laboratorio all'ingresso: GB 13.4, Neutrofili 82%, HB 12.2 gr/dl, prot. Tot. 6.9 gr, Alb. 44%, K 5.94.

Valutazione multidimensionale: Barthel 0/100, Norton 6/24 (rischio elevato), Tinetti 0/28, MMSE non somministrabile.

Valutazione fisioterapista: paziente non collaborante, disorientata ed eloquio disartrico. Atteggiamento flessorio con forte rigidità arti inferiori rispetto ai superiori. Si propone mobilizzazione passiva a letto per ridurre atteggiamento flessorio arti superiori ed inferiori. Si mobilizza in carrozzina con sollevatore passivo.

Controllo FKT: si rileva collaborazione alterna. Si rileva che il posizionamento in carrozzella favorisce un maggior rilassamento generale dell'ospite con la possibilità (saltuaria) di movimenti attivi assistiti a livello del cingolo scapolare.

Sign.ra RM di anni 85

PIANO DI ASSISTENZA INDIVIDUALIZZATO (Apr. 06)

Problemi:

Alimentazione ed idratazione. Movimentazione. Lesioni da decubito. Igiene personale.Ospite Disfagica e non collaborante.

Obiettivi:

Normalizzare l’apporto calorico ed idrico. Riduzione superfici lesioni da decubito.

Interventi:

Si utilizzano posate e siringa per l’alimentazione. Terapia infusiva intermittente. Posizionamento a letto ogni 2 ore. Medicazione lesioni da decubito. Materassino antidecubito. Controllo cute. Corretta igiene cute. Igiene cavo orale 2 volte al di’.

Sign.ra RM di anni 85

PIANO DI ASSISTENZA INDIVIDUALIZZATO (Apr. 06)

Problemi:
Lesioni da decubito multiple, ridotto intake calorico ed idrico.

Obiettivi:
assicurare intake calorico ed idrico adeguato, riduzione superficie lesione da decubito.

Interventi:
Posizionamento SNG con attivazione di nutrizione enterale con 1750 cal/die e somministrazione di liquidi (colloquio con parente).

Verifica risultati:
Nessuna variazione delle lesioni. La valutazione dell'intake calorico è insufficiente, il controllo del peso dall'ingresso alla verifica ha mostrato un calo ponderale di 1 Kg.

Sign.ra RM di anni 85

PIANO DI ASSISTENZA INDIVIDUALIZZATO (Maggio 06)

Problemi:
Lesioni da decubito multiple.

Obiettivi:
assicurare intake calorico ed idrico adeguato, riduzione superficie lesione da decubito.

Interventi:
Si sospende nutrizione enterale e si utilizza la via orale.
Integratore equilibrato con 600 cal/die con aggiunta di addensante.

Verifica risultati:
Incremento ponderale di 2 Kg in 30 gg. Nessuna variazione delle lesioni delle lesioni da decubito.

Sign.ra RM di anni 85

Diario Clinico

Problemi all'ingresso: lenta risoluzione dell'infezione delle vie aeree basse. Febbricola. Si modifica terapia antibiotica.

Il **29.4.06** Si posiziona SNG e si prescrive nutrizione enterale con 1750 cal /die.

Il **3.5.06** sospesa terapia antibiotica.

L'11.6.06 episodio febbrile con segni di infezione vie respiratorie basse con trattamento antibiotico.

Adherence to Pressure Ulcer Prevention Guidelines: Implications for Nursing Home Quality

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OBJECTIVES: This study aims to assess overall nursing home (NH) implementation of pressure ulcer (PU) prevention guidelines and variation in implementation rates among a geographically diverse sample of NHs.

DESIGN: Review of NH medical records.

SETTING: A geographically diverse sample of 35 Veterans Health Administration NHs.

PARTICIPANTS: A nested random sample of 834 residents free of PU on admission.

MEASUREMENTS: Adherence to explicit quality review criteria based on the Agency for Healthcare Research and Quality Practice Guidelines for PU prevention was measured. Medical record review was used to determine overall and facility-specific adherence rates for 15 PU guideline recommendations and for a subset of six key recommendations judged as most critical.

RESULTS: Six thousand two hundred eighty-three instances were identified in which one of the 15 guideline recommendations was applicable to a study patient based on a line recommendations, ranging from 29% to 51% overall adherence across all 15 recommendations ($P < .001$) and from 24% to 75% across the six key recommendations ($P < .001$). Adherence rates for specific indications also varied, ranging from 94% (skin inspection) to 1% (education of residents or families). Standardized assessment of PU risk was identified as one of the most important and measurable recommendations. Clinicians performed this assessment in only 61% of patients for whom it was indicated.

CONCLUSIONS: NHs' overall adherence to PU prevention guidelines is relatively low and is characterized by large variations between homes in adherence to many recommendations. The low level of adherence and high level of variation to many best-care practices for PU prevention indicate a continued need for quality improvement, particularly for some guidelines. J Am Geriatr Soc 51:56–62, 2003.

Key words: nursing home; quality improvement; pressure ulcers; guidelines

Table 2. Quality Review and Utilization Criteria Pressure Ulcer Prevention*

	Criterion	Overall Adherence (n compliant/ n indicated)	Range of Facility Adherence % (*P*-value)*†
1‡	IF a person is admitted to a NH, THEN an assessment of pressure ulcer (PU) risk should be performed.	61% (507/834)	0–100 (<.0001)
2‡	IF a person remains in a NH, THEN reassessments of PU risk should be performed at periodic intervals. (Current study measures whether risk is reassessed between Week 2 and Week 6).	17% (73/424)	0–76 (<.0001)
3‡	IF a NH resident is at risk for PU, THEN a systematic skin inspection that pays attention to bony prominences should be performed at least once a day. (Current study measures whether skin inspection is performed at least once).	94% (668/712)	75–100 (.110)
4	IF a NH resident is incontinent of urine or stool, THEN skin cleansing should occur at the time of soiling. (Current study measures whether skin cleansing is planned or performed).	10% (56/559)	0–38 (.0034)
5	IF a NH resident has dry skin, THEN the skin should be treated with moisturizers.	40% (31/77)	0–100 (.073)
6	IF a NH resident is incontinent and exposure to urine/stool is not controlled, THEN underpads, briefs, or topical agents that act as barriers to moisture should be used.	87% (486/559)	60–100 (.302)
7	IF a NH resident is immobile or has altered level of consciousness, THEN exposure to friction/sheer forces should be minimized through proper positioning, transferring and turning techniques and lubricants, protective films, protective dressings, or protective padding. (Study measures whether positioning, protective dressings, or education of resident about repositioning is planned, ordered, or implemented.)	32% (95/298)	0–100 (<.0001)

	about repositioning is planned, ordered, or implemented.)		
8	IF a NH resident has inadequate dietary intake, THEN approaches to improving intake should be considered or implemented.	86% (301/349)	56–100 (.117)
9‡	IF a NH resident is nutritionally compromised, THEN a plan for nutritional support or supplement should be implemented.	37% (129/349)	0–67 (.048)
10‡	IF a NH resident is confined to bed (immobility, remains in bed), THEN repositioning should be scheduled and performed every 2 hours. (Study measures whether repositioning is planned or implemented)	69% (37/54)	0–100 (.019)
11	IF a NH resident is confined to bed, THEN positioning devices should be used to keep bony prominences from direct contact.	11% (6/54)	0–50 (.798)
12	IF a NH resident is immobile and confined to bed, THEN devices that relieve pressure on heels should be used.	17% (49/292)	0–50 (.197)
13	IF a NH resident is immobile or has altered level of consciousness, THEN lifting devices or bed linens should be used to move the resident in bed.	10% (29/298)	0–50 (.097)
14‡	IF a NH resident is at risk for PU, THEN a pressure-reducing device (foam, static air, alternating air, gel, or water mattress) should be used when lying in bed.	18% (128/712)	0–65 (<.0001)
15	IF a NH resident is at risk for PU, THEN education addressing PU prevention should be provided to the resident and family caregiver.	1% (9/712)	0–8 (.860)

*Range reports the highest- and lowest-scoring NH for the individual quality indicator.

†*P*-value gives significance test for the association between facility of residence and compliance for a each recommendation.

‡Key criteria.

NH = nursing home; PU = pressure ulcer.

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REVIEW ARTICLE

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Issues and Dilemmas in the Prevention and Treatment of Pressure Ulcers: A Review

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Considerable dogma and rhetoric, rather than evidence-based results, have accompanied recommendations for the prevention and treatment of pressure ulcers. Therapy for pressure ulcers is generally empiric, based on anecdotal experience, or borrowed from the treatment of patients with acute wounds. The treatment of pressure ulcers is problematic because of multiple comorbidities of patients, the chronic duration of pressure ulcers, and often by the physician's relative unfamiliarity with treatment options. Issues and dilemmas in the prevention of pressure ulcers center around risk assessment, means of pressure relief, and nutritional support. Similar issues in the treatment of pressure ulcers include implementing pressure relief, nutritional support, local wound care, the best method of debridement, diagnosing infection, the use of topical growth factors, and surgical treatment. The accumulating data for the prevention and management of pressure ulcers permits an outline of clinical strategies.

Table 1. Comparison of Risk Assessment Instruments

Variable	Norton	Braden	Waterlow
Mobility	X	X	X
Moisture exposure	X	X	X
Physical activity	X	X	
General condition	X		X
Nutrition		X	
Appetite			X
Friction/shear force		X	
Sensory perception		X	
Mental status	X		
Skin type			X
Medication			X
Weight			X
Age			X
Gender			X
Other (e.g., disease)			X

Note: X = Scale contains the item.

Table 2. Comparison of a Standard Mattress to Pressure-Reducing Devices in the Prevention of Pressure Ulcers

Population	Intervention	Results	Relative Risk (95% CI)
Prospective, randomized trial in acute care patients with femoral neck fracture (101)	DeCube mattress vs standard mattress	Incidence 25% on experimental mattress vs 64% control	0.35 (0.14–0.85)
Prospective, randomized trial in surgical and oncology patients (102)	Softfoam mattress vs standard mattress	Incidence 7% on treatment device vs 34% control	0.20 (0.09–0.45)
Prospective, non-random trial in long-term care (103)	Clinifloat foam mattress vs standard mattress	Incidence 2.0% on treatment vs 2.4% control	No difference between groups
Meta-analysis (12)	Standard mattress vs foam support	Four trials	Average risk reduction of 71% (57%–81%)
Prospective, randomized trial in orthopedic patients (104)	Bead bed vs standard mattress		0.32 (0.14–0.76)
Prospective, randomized controlled trial in an intensive care unit (105)	Air-filled support vs standard mattress	Incidence 0% on air mattress vs 37% on standard mattress	0.06 (0–0.99)
Prospective, randomized trial in acute care (106)	Alternating-pressure mattress vs water mattress vs standard mattress	Incidence 4% alternating vs 5% water vs 13% on standard mattress	0.35 (0.15–0.79) water mattress compared with standard
Meta-analysis (12)	Standard mattress vs constant low-pressure support	Three trials	Average risk reduction of 70%
Prospective, randomized trials in intensive care units (107,108)	Standard mattress vs kinetic turning beds	Two trials	No difference between groups
Prospective, randomized controlled trial in intensive care unit (109)	LAL vs standard mattress	Incidence 12.2% on LAL vs 51% on standard mattress	0.24 (0.11–0.53)
Quasi-experimental design in an intensive care unit (110)	Low-air-loss bed vs standard mattress	Incidence 19% on LAL vs 15% on standard mattress	No difference between groups

Notes: RR = relative risk; CI = confidence interval; LAL = low-air-loss; Constant Low Pressure support = static air-filled, water-filled, gel-filled, bead-filled, or silicone-filled supports, sheepskin, or foam supports. Meta-analysis results include only the studies meeting the author's inclusion criteria. Some trials included in the meta-analysis are listed separately. See reference for specifics.

Table 4. Epidemiological Association of Nutritional Markers With Development of a Pressure Ulcer

First Author	Setting	Associated With the Presence of Pressure Ulcer	Not Associated With the Presence of Pressure Ulcer
Allman (27)	AC	Albumin	Weight, hemoglobin, TLC, nutritional assessment
Gorse (45)	AC	Albumin	Nutritional assessment score
Inman (109)	AC, ICU	Albumin (measured at 3 d)	Serum protein, hemoglobin, weight
Allman (27)	AC	BMI, TLC	Albumin, TSF, arm circumference, weight loss, hemoglobin, nitrogen balance
Hargink (26)	AC, orthopedic		Nocturnal enteral feeding
Anthony (125)	AC	Albumin, <32 g/dl	
Moolten (126)	LTC	24/28 had albumin, <3.5 g/dl	
Pinchcofsky-Devin (127)	LTC	Severe malnutrition by biochemical markers	Mild-to-moderate malnutrition or normal nutrition
Berlowitz (128)	LTC	Impaired nutritional intake	Albumin, serum protein, hemoglobin, TLC, BMI/weight
Bennett (28)	LTC		Weight, BMI, weight gain
Brandeis (129)	LTC	Dependency in feeding	BMI/weight, TSF
Trumbore (130)	LTC	Albumin, cholesterol	
Breslow (131)	LTC	Albumin, hemoglobin	Serum protein, cholesterol, zinc, copper, transferrin, body weight, BMI, TLC
Bergstrom (97)	LTC	Dietary protein intake 93% of RDA, dietary iron	Serum protein, cholesterol, zinc, copper, transferrin, weight, BMI, TLC
Ferrell (29)	LTC		Albumin, serum protein, BMI, hematocrit
Bourdel-Marchasson (24)	LTC		Oral nutritional supplement (26% vs 20% incidence)
Guralnik (132)	Community		Albumin, BMI, impaired nutrition, hemoglobin

Note: AC = acute care; LTC = long-term care; BMI = body mass index; TLC = total lymphocyte count; TSF = triceps skinfold thickness; ICU = intensive care unit; RDA = recommend daily allowance.

Table 7. Moist Dressings Compared With Wet-to-Dry Saline Dressings in the Treatment of Pressure Ulcers

Treatment	Measure	Results OR (95% CI)
Film dressing vs wet-to-dry saline gauze (47)	Complete healing	42.65 (2.23–815.5)
Iodosorb vs wet-to-dry saline gauze (143)	Complete healing	5.94 (0.88–40.1)
Hydrocolloid vs wet-to-dry Dakin's solution (45)	Complete healing	2.46 (1.18–5.12)

Note: OR = odds ratio; CI = confidence interval.

Table 9. Occlusive Dressing Compared With Moist Saline Dressing in the Treatment of Pressure Ulcers

Treatment	Measure	Results OR (95% CI)
Hydrocolloid (Comfeel) vs moist saline (50)	Complete healing	4.09 (1.18–14.14)
Hydrocolloid (Duoderm) vs moist saline (51)	Complete healing	14.27 (1.76–15.56)
Hydrocolloid vs moist saline (53)	Complete healing	2.03 (0.52–7.52)
Hydrocolloid vs moist saline (144)	Complete healing	1.39 (0.55–3.49)
Hydrocolloid (Duoderm) vs moist saline (145)	34% decrease in surface area vs 9% increase in control	$p = .23$
Hydrocolloid vs moist saline (146)	Complete healing	81% of HCD vs 78% of saline group ($p > .05$)
Polyurethane (Opsite) vs moist saline (147)	% reduction in area	22.3 (−27.43–72.09)
Foam dressing (Epi-Lock) vs moist saline (148)	Complete healing	2.62 (0.58–11.89)
Hydrogel (Carrasyn) vs moist saline (149)	Complete healing	0.93 (0.28–3.09)
Hydrogel vs moist saline (150)	Relative volume	64% vs 26% of initial size

Note: OR = odds ratio; CI = confidence interval.

Prevention and Treatment of Pressure Ulcers

David R. Thomas, MD, FACP

Pressure ulcers are complex chronic wounds for which no gold standard for prevention or treatment has yet been established. Several attempts at developing guidelines has been undertaken by different organizations. Pressure ulcers are devastating comorbidities for patients and difficult to prevent or manage. Whether or not pressure ulcers are preventable remains controversial. The strategy for prevention includes recognizing the risk, decreasing the effects of pressure, assessing nutritional status, avoiding excessive bed rest and prolonged sitting, and preserving the integrity of the skin. The principles of treatment of pressure ulcers include assessing severity, reducing pressure, friction and shear forces, optimizing local wound care, removing necrotic debris, managing bacterial contamination, and correcting nutritional deficits. **(J Am Med Dir Assoc 2006; 7: 46–59)**

Table 3. *Nutritional Interventions in the Prevention of Pressure Ulcers*

First Author	Year	Setting	Intervention	Risk Reduction	95% CI
Delmi[51]	1990	Acute femur fracture	Standard diet vs Standard diet plus nutritional supplement	0.79	0.14 to 4.39
Hartgrink[36]	1998	Acute hip fracture	Standard diet vs Standard diet and overnight nasogastric tube feeding	0.92	0.64 to 1.32
Houwing[52]	2003	Acute hip fracture	Standard diet plus water placebo vs Standard diet plus 1 daily supplement (includes arginine)	59% vs 55%	NS
Bourdel- Marchasson[53]	2000	Critical illness, age >65 years	Standard diet vs Standard diet plus 2 oral supplements	0.83	0.70 to 0.99

95% CI, 95% confidence interval.

Table 4. *Comparison of Occlusive Wound Dressings*

	Moist Saline Gauze	Polymer Films	Polymer Foams	Hydro-gels	Hydro-colloids	Alginates, Granules	Biomembranes
Pain relief	+	+	+	+	+	±	+
Maceration of surrounding skin	±	±	–	–	–	–	–
O_2 permeable	+	+	+	+	–	+	+
H_2O permeable	+	+	+	+	–	+	+
Absorbent	+	–	+	+	±	+	–
Damage to epithelial cells	±	+	–	–	–	–	–
Transparent	–	+	–	–	–	–	–
Resistant to bacteria	–	–	–	–	+	–	+
Ease of application	+	–	+	+	+	+	–

+, positive; –, negative; ±, equivocal.
Sources: Adapted from Helfman et al[79] and Witkowski and Parish.[80]

Table 5. *Growth Factors and Pressure Ulcers*

Growth Factor	N	Healing Rate Active	Healing Rate Placebo	Measure
rhPDGF[87]	124 in 4 groups	23%	0%	Complete closure
rhPDGF [88]	41 in 3 groups	No difference	No difference	Time to 50% closure or ulcer volume
rbFGF[89]	50 in 8 groups	Greater closure ($P < .05$)		>70% closure
rIL 1[90]	26 in 4 groups	No difference	No difference	Closure
rhGM-CSF and rbFGF[91]	61 in 4 groups	No difference	No difference	>85% closure
rNGF[92]	36 in 2 groups (heel only)	44%	5%	Closure

rhPDGF, Recombinant human platelet-derived growth factor; rbFGF, recombinant basic fibroblast growth factor; rIL 1, recombinant human interleukin-1; rhGM-CSF, granulocyte-macrophage colony-stimulating factor; rNGF, topical nerve growth factor.

Table 6. *Nutritional Interventions in the Treatment of Pressure Ulcers*

First Author	Setting	Intervention	Outcome
Breslow[115]	Long-term care	24% protein vs 14% protein enteral feeding	$-4.2\ cm^2$ vs $-2.1\ cm^2$ decrease in surface area
Chernoff[112]	Long-term care	1.8 g/kg protein vs 1.2 g/kg protein enteral feeding	RR 0.11 (95% CI 0.01 to 1.70)
Henderson[116]	Long-term care	1.6 times basal energy expenditure, 1.4 g of protein per kilogram per day	65% PU at onset; 61% prevalence at 3 months
Langkamp-Henken[117]	Long-term care	Arginine 0 gm vs arginine 17 gm	No difference in healing
ter Riet[118]	Long-term care	Vitamin C 10 mg vs 1000 mg	RR 0.81 (95% CI 0.50 to 1.30)
Taylor[119]	Acute surgical patients	Vitamin C large dose vs none	84% vs 43% (control) reduction surface area at 30 days
Norris[120]	Acute hip fracture	Zinc	No difference

RR, Relative risk (95% confidence intervals [CI]); PU, pressure ulcer.

DIRECTIONS: Observe and measure the pressure ulcer. Categorize the ulcer with respect to surface area, exudate, and type of wound tissue. Record a sub-score for each of these ulcer characteristics. Add the sub-scores to obtain the total score. A comparison of total scores measured over time provides an indication of the improvement or deterioration in pressure ulcer healing.

	0 0 cm^2	**1** < 0.3 cm^2	**2** 0.3–0.6 cm^2	**3** 0.7–1.0 cm^2	**4** 1.1–2.0 cm^2	**5** 2.1–3.0 cm^2	
Length × width		**6** 3.1–4.0 cm^2	**7** 4.1–8.0 cm^2	**8** 8.1–12.0 cm^2	**9** 12.1–24.0 cm^2	**10** >24.0 cm^2	**Sub-score**
Exudate amount	**0** None	**1** Light	**2** Moderate	**3** Heavy			**Sub-score**
Tissue type	**0** Closed	**1** Epithelial tissue	**2** Granulation tissue	**3** Slough	**4** Necrotic tissue		**Sub-score**
							Total Score

Fig. 1. *Pressure Ulcer Scale for Healing (PUSH Tool) Version 3.0. Reprinted with permission from NPUAP. Copyright 2003, NPUAP.*

Table 3. Comparison Among Pressure-Reducing Devices in the Prevention of Pressure Ulcers

Population	Intervention	Results	Relative Risk (95% CI)
Prospective, nonrandom, controlled-trial intensive care patients (111)	Static foam vs two dynamic replacement mattresses	Incidence 8% in all groups	No difference between groups
Prospective, randomized trial in high-risk intensive care patients (112)	Air-filled vs gel-filled pad	Incidence 32% on gel pad vs 32% on air pad	No difference between groups
Prospective, controlled trial in intensive care unit (113)	Alternating pressure mattress vs various other overlays	Incidence 13% alternating pressure vs 34% all other devices	0.38 (0.22–0.66)
Prospective, controlled trial in intensive care unit (114)	Alternating air mattress vs static air mattress vs water mattress	Incidence 20% alternating vs 5% static vs 10% water	No difference between groups
Prospective, randomized trial in intensive care unit (115)	Two groups of risk-based pressure-reducing systems	Incidence 24% vs 30% in both groups	No difference between groups
Prospective, randomized trial in acute care (116)	3″ convoluted foam mattress vs 4″ solid foam mattress	Incidence 47% vs 31%	Higher rate on 3″ foam
Prospective, randomized trial in orthopedic patients (117)	Airwave vs Large Cell Ripple alternating air mattress	Incidence 16% vs 34% ($p > .05$)	No difference between groups
Prospective, randomized trial in long-term care (118)	Maxifloat overlay vs 4″ foam mattress		0.42 (0.18–0.96)
Prospective, randomized trial in long-term care (119)	Two pressure-reducing devices	Incidence 32% on both devices	No difference between groups
Prospective, randomized trial in long-term care (neurological impairment) (120)	Alternating air mattress vs silicone overlay	Incidence 25% in both groups	No difference between groups
Prospective, randomized trial in long-term care (neurological impairment) (121)	Alternating air mattress vs silicone overlay	Incidence >50% in both groups	No difference between groups
Prospective, randomized trial in acute and long-term care (122)	LAL bed vs all other surfaces	Incidence 19% on experimental device vs 7% on all other surfaces	Experimental device was worse
Meta-analysis (12)	Silicone overlay, water, foam, static-air mattress	Six trials	No difference between groups
Prospective, randomized controlled trial in operating theater (123)	Operating table overlay vs standard table		0.53 (0.33–0.85)
Prospective, randomized controlled trial in operating theater (124)	Alternating pressure support vs gel pad and standard mattress		0.21 (0.06–0.7)

Notes: CI = confidence interval; LAL = low-air-loss. Meta-analysis results include only the studies meeting the author's inclusion criteria. Some trials included in the meta-analysis are listed separately. See reference for specifics.

Feasibility of Quality Indicators for the Management of Geriatric Syndromes in Nursing Home Residents

Debra Saliba, MD, MPH, David Solomon, MD, Laurence Rubenstein, MD, MPH, Roy Young, MD, John Schnelle, PhD, Carol Roth, RN, MPH, and Neil Wenger, MD, MPH

Purpose: The assessment and management of dementia, falls and mobility disorders, malnutrition, end-of-life issues, pressure ulcers, and urinary incontinence have been identified as important quality improvement targets for vulnerable elders residing in nursing homes. This study aimed to identify valid and feasible measures of specific care processes associated with improved outcomes for these conditions.

Methods: Nine experts in nursing home (NH) care participated in a modified Delphi process to evaluate potential quality indicators (QIs) for care in NHs. Panelists met and discussed potential indicators before completing confidential ballots rating validity (process associated with improved outcomes), feasibility of measurement (with charts or interviews), feasibility of implementation (given staffing resources in average community NHs), and importance (expected benefit and prevalence in NHs). The NH panel's median votes were used to identify a final set of QIs that were subsequently reviewed by a clinical oversight committee.

Results: Sixty-eight geriatric syndrome QIs were identified as valid and important in NH populations. Panelists assessed 12 (18%) of these QIs as having questionable feasibility to implement in average community nursing homes trying to provide quality care. Nine (13%) would not be included in systems assessing quality of care for persons with advanced dementia or poor prognosis.

Conclusions: Steps of care critical to the assessment and management of geriatric syndromes in NHs were identified. Feasibility is an important issue for a significant number of these, indicating that much remains to be done to design systems that efficiently and reliably implement these care processes. **(J Am Med Dir Assoc 2005; 6: S50–S59)**

Keywords: Nursing home; quality; dementia; falls; mobility; malnutrition; end-of-life care; pressure ulcers; urinary incontinence

Table 4. *Quality Indicators for the Management of Geriatric Syndromes in Nursing Home (NH) Residents (continued)*

Topic	NH Indicator	Notes
Address nutrition during hip rehabilitation	IF a NH resident is transferred to the NH for rehabilitation/recovery after hospitalization for hip fracture and has evidence of nutritional deficiency, THEN oral or enteral nutritional protein-energy supplementation should be initiated on NH admission.	Exclude if advanced dementia or poor prognosis
Pressure ulcers (8 quality indicators)		
Assess risk	IF a NH resident is unable to reposition himself or herself, or has limited ability to do so, THEN a risk assessment using a multidimensional standardized scale (eg, the Braden scale or Norton scale) should be performed on admission and every week during the first 4 weeks.	
Initiate prevention	IF a NH resident is identified as "at risk" for pressure ulcer development or a pressure ulcer risk assessment score indicates that the person is "at risk," THEN within 24 hours preventive intervention must address all of the following: (1) repositioning by written schedule every 2 hours or there should be documentation that repositioning is not needed or not tolerated; (2) pressure reduction (or management of tissue loads) unless there is documentation that this is not needed or not tolerated; and (3) nutritional status.	

	ulcerated, and (3) nutritional status.	
Evaluate pressure ulcer	IF a NH resident is found to have a pressure ulcer, THEN the pressure ulcer should be assessed for location, depth and stage, size, AND presence of necrotic tissue.	
Assess nutrition	IF a NH resident is found to have a pressure ulcer, THEN a nutritional assessment should be performed within 1 week by a dietician or a PCP.	
Reassess partial thickness at 2 weeks	IF a NH resident has a partial-thickness pressure ulcer and has no improvement after 2 weeks of treatment, THEN the appropriateness of the treatment plan should be reassessed by the PCP or an RN.	Feasibility of measurement questionable
Debride necrotic tissue	IF a NH resident presents with a full-thickness sacral or trochanteric pressure ulcer covered with necrotic debris or eschar, THEN debridement by using sharp, mechanical, enzymatic, or autolytic procedures should be done within 3 days of diagnosis.	
Do not use topical antiseptic	IF a NH resident has a stage 2 or greater pressure ulcer, THEN a topical antiseptic should not be used on the wound. IF a NH resident presents with a clean full-thickness or a partial-thickness pressure ulcer, THEN a most wound-healing environment should be provided with topical dressings.	
Topical dressings		

Cost Analysis of Nursing Home Registered Nurse Staffing Times

David A. Dorr, MD, Susan D. Horn, PhD,*† and Randall J. Smout, MS†*

OBJECTIVES: To examine potential cost savings from decreased adverse resident outcomes versus additional wages of nurses when nursing homes have adequate staffing.

DESIGN: A retrospective cost study using differences in duction in adverse outcomes. Challenges in increasing nurse staffing are discussed. J Am Geriatr Soc 53:840–845, 2005.

Key words: cost analysis; long-term care; nurse staffing

Table 1. Event Rates for Hospitalizations, Pressure Ulcers, and Urinary Tract Infections in Nursing Homes by 10-Minute Increments of Registered Nurse Time/Resident Per Day

Event Type	Minutes				All	Event Rate Improvement
	<10 (low) (n = 310)	10–20 (n = 531)	20–30 (n = 355)	30–40 (high) (n = 180)	(n = 1,376)	
Number of nursing homes	24	30	21	7	82	
Aggregate resident days	23,560	42,241	27,679	14,622	108,102	
Pressure ulcer, n	118	169	89	17	393	
Pressure ulcer rate per day	5.01×10^{-03}	4.00×10^{-03}	3.22×10^{-03}	1.16×10^{-03}	3.64×10^{-03}	3.85×10^{-03}*
Hospitalization, n	57	59	34	11	161	
Hospitalization rate per day	2.42×10^{-03}	1.40×10^{-03}	1.23×10^{-03}	0.75×10^{-03}	1.49×10^{-03}	1.67×10^{-03}*
UTIs, n	53	77	46	15	191	
UTI rate per day	2.25×10^{-03}	1.82×10^{-03}	1.66×10^{-03}	1.03×10^{-03}	1.77×10^{-03}	1.22×10^{-03}*

Note: Rates are per high-risk resident per day.

* Event rate improvements used in Table 3.

UTI = urinary tract infection.

The Effects of Changes in Nursing Home Staffing on Pressure Ulcer Rates

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Objective: To examine the relationships between various components of nursing home staffing (total staffing levels and staff mix, staff turnover, and changes in staffing patterns) to an important measure of quality, risk-adjusted rates of pressure ulcer development.

Design, Setting, and Measurements: Staffing records from 35 Department of Veterans Affairs (DVA) nursing homes were reviewed and nursing home administrators from each of the facilities were interviewed. Incidence rates for pressure ulcers were obtained from DVA's national long-term care database and risk adjusted using patients' baseline characteristics. The relationships of risk-adjusted pressure ulcer rates to staffing patterns were tested.

tween staffing levels and pressure ulcer rates, data analysis revealed a strong trend ($P = .07$) that among the nursing homes meeting staffing guidelines, 60% were among the best performing. Ten nursing homes reduced staffing levels from their baseline levels at the beginning of the study and/or changed their staffing mix by replacing licensed personnel with nursing assistants. This change was associated with a 2.1% higher rate of pressure ulcer development ($P = .004$)

Conclusion: Changes in nursing home staffing patterns (either a decrease in overall staffing levels or a change in staffing mix) are related to the quality of nursing home care. Staff stability is associated with better outcomes. **(J Am Med Dir Assoc 2005; 6: 50–53)**

Quality Improvement in Nursing Homes in Texas: Results From a Pressure Ulcer Prevention Project

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Background: Pressure ulcer prevalence, cost, associated mortality, and potential for litigation are major clinical problems in nursing homes despite guidelines for prevention and treatment.

Objective: To improve the use of pressure ulcer prevention procedures at nursing homes in Texas through implementation of process of care system changes in collaboration with a state quality improvement organization (QIO).

Design: Preintervention and postintervention measurement of performance for process of care quality indicators and of pressure ulcer incidence rates.

Setting: Twenty nursing homes in Texas.

Participants: Quality improvement teams at participating nursing homes.

Measurement: Data were abstracted from medical records on performance measures (quality indicators) and pressure ulcer incidence rates between November 2000 and August 2002. Descriptive and inferential statistics were used.

Interventions: Process of care system changes consisting of tools and education to prevent pressure ulcers were introduced to participating nursing homes.

Results: Participating nursing homes showed statistically significant improvement in 8 out of 12 quality indicators. Pressure ulcer incidence rates also decreased, although not quite significantly. Furthermore, facilities with the greatest improvement in quality indicator scores had significantly lower pressure ulcer incidence rates than the facilities with the least improvement in quality indicator scores ($S = 131.0$, $P = .03$). This suggests that the interventions positively affected not only the process of care but also led to a decrease in pressure ulcer incidences.

Conclusions: These results show that nursing homes in a collaborative effort with a QIO were able to improve their processes of care. Although significant improvement was noted on most of the quality indicators, opportunity remains for further improvement. Furthermore, these results suggest that implementation of process of care system changes by nursing homes in a collaborative relationship with a QIO may yield improvements in measures of patient outcome (eg, pressure ulcer incidence). **(J Am Med Dir Assoc 2005; 6: 181–188)**

Keywords: Quality improvement; nursing homes; pressure ulcers

Long-Term Care Liability for Pressure Ulcers

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(See editorial comments by Nancy Bergstrom on pp 1627–1629)

Table 3. Comparison of the Number of Pressure Ulcer (PU) Lawsuits per 1,000 Residents on a State Basis

	1984–1999			1999–2002		
	PU Cases	Residents 1995		PU Cases	Residents 2001	
State	n		Cases/1,000 Residents	n		Cases/1,000 Residents
Alabama	3	21,691	0.138			
Arkansas	—	—	—	2	18,677	0.107
Arizona	—	—	—	3	13,455	0.223
California	9	109,805	0.082	6	105,923	0.057
Florida	38	61,845	0.614	12	70,029	0.170
Georgia	3	35,933	0.083	—	—	—
Illinois	5	83,696	0.060	—	—	—
Louisiana	2	32,493	0.062	—	—	—
Maryland	1	24,716	0.040	—	—	—
Michigan	8	43,271	0.185	—	—	—
Missouri	1	39,891	0.025	—	—	—
New Jersey	1	40,397	0.025	—	—	—
New York	1	103,409	0.010	1	114,141	0.009
Ohio	4	79,026	0.013	—	—	—
Oklahoma	1	26,377	0.038	—	—	—
Pennsylvania	1	84,843	0.012	1	82,971	0.012
Texas	31	89,354	0.347	19	85,517	0.222
Virginia	1	28,119	0.036	—	—	—
Washington	—	—	—	3	20,663	0.145

Note: Resident data obtained from www.cdc.gov/nchs/hus.htm.

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Comorbidity, frailty, and evolution of pressure ulcers in geriatrics

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C Statistical Analysis
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Summary

The prevalence of pressure ulcers (PUs) ranges from 1 to 18% of in-patients and from 3 to 28% in long-term settings. The aim of our study was to verify how comorbidity and frailty influenced the course of PUs in a population of elderly subjects hospitalized in a long-term care setting.

The charts of 125 patients with pressure ulcers were evaluated retrospectively. For each subject we took note of PU characteristics (stage, ulcer surface, evolution), and clinical characteristics (comorbidity, adverse clinical events, and cognitive, functional, and nutritional status). Frailty was defined considering age, cognitive functions, and functional and nutritional status.

In 58 patients (46.4%) there was overall resolution of the lesions, while in 39 patients (31.2%) we had "improvement" of PUs. The course of PU was not significantly influenced by the patient's physiological characteristics, cognitive status, or the initial characteristics of PU. We noticed a significant difference in the course of PUs as a function of autonomy level and clinical and nutritional status. During the observation period we found significant differences in the frailty scores: 87.2% of those who showed an improvement in the score had resolution or improvement in PUs, while this occurred in only 27.3% of those who had a worsening in the level of frailty.

We maintain that integration of multidimensional assessment, with special attention to comorbidity status and to frailty (particularly autonomy level and nutritional status), and the different approaches may allow optimal healing of PUs.

comorbidity • frailty • elderly • pressure ulcers

Are All Pressure Ulcers Avoidable?

David R. Thomas, MD, FACP

A quality of care debate centers on whether pressure ulcers result from factors largely dependent on caregivers, or whether pressure ulcers result from factors associated with patient morbidity. A reduction in incidence, defined as the development of a new pressure ulcer, is the focus of prevention strategies. Yet epidemiological data demonstrates a stability in the incidence of pressure ulcers despite drastic improvements in understanding of pressure ulcers, increased regulatory oversight, and improvements in technologies available for prevention of pressure ulcers. The explanation for this stable incidence of pressure ulcers includes a failure of known effective preventive treatment to be applied or the failure of prevention strategies to be effective in spite of being applied. No intervention strategy has been reported that consistently and reproducibly reduces the incidence of pressure ulcers to zero. The published data on prevention of pressure ulcers do not support an assumption that all pressure ulcers are preventable. An effective prevention strategy demonstrated to eliminate pressure ulcers across healthcare settings is lacking. **(J Am Med Dir Assoc 2003; 4: S44–S48)**

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