Healthcare quality and ergonomics in long-term care. Participatory ergonomics to implement changes

Madeleine Estryn-Behar (MD, PhD),
Occupational medicine
Hôtel-Dieu AP-HP
Parvis Notre Dame 75004 Paris
33 1 42 34 88 17
madeleine.estryn-behar@sap.aphp.fr

Anne-Emilie Ravache (MSc)3rd author's affiliation
Occupational medicine
Hôtel-Dieu AP-HP
Parvis Notre Dame 75004 Paris
33 1 42 34 88 17
anne-emilie.ravache@sap.aphp.fr

Giuliana Milanini-Magny (Architect)
Occupational medicine
Hôtel-Dieu AP-HP
Parvis Notre Dame 75004 Paris
33 1 42 34 88 17
magnyallo@tiscali.fr

Hélène Deslandes (MSc)
Occupational medicine
Hôtel-Dieu AP-HP
Parvis Notre Dame 75004 Paris
33 1 42 34 88 17
helene.deslandes@sap.aphp.fr

Clémentine Fry (MSc)
Occupational medicine
Hôtel-Dieu AP-HP
Parvis Notre Dame 75004 Paris
33 1 42 34 88 17
Clementine.fry@sap.aphp.fr

TOPICS – HEALTHCARE QUALITY AND ERGONOMICS

KEYWORDS
Ergonomics; Quality of care; Geriatrics

1. INTRODUCTION
Health care workers (HCWs) in long-term care suffer more burnout and musculoskeletal disorders than other HCWs do, according to the NEXT study (10 participating countries, among which 4,979 HCWs involved in long term care). This research has also indicated that inadequate equipment and social support threaten the provision of adequate healthcare. Quality of care can be improved and HCWs' health can be protected by implementing processes that rely on multidisciplinary teamwork and by designing wards and equipment better.

2. METHODOLOGY
An action research model was used. It transferred ergonomic knowledge to nurses, nursing aids and head nurses. These HCW, along with ergonomists, then co-elaborated the necessary changes in three nursing homes. Continuous observations of HCWs' whole work-posts by different occupational categories at different work schedules were conducted by ergonomists and by trained HCWs. Time spent in the different rooms, activities undertaken, and interruptions, verbal exchanges and work postures were studied. Space analysis was also used to understand the influence of space constraints on the way activities were accomplished.

3. RESULTS

3.1 Burnout and musculoskeletal disorders among HCWs working in long stay facilities and nursing homes
Healthcare workers in nursing home and geriatric care facilities declare more musculoskeletal disorders (MSDs) with the exception of those in home- and daycare, who usually obtain this specialty after a long career in other posts (table 1). Their score of burnout (Copenhagen burnout inventory) is frequently high. They are among the more dissatisfied with their physical working conditions, the psychological support they receive at work and their opportunities to give their patients the care they need.

Table 1. Health problems and satisfaction at work according to specialty in the NEXT study

	Med-surg	ICU	Home & day care	Ped. Gyn. Ob	Nur. Ho. Geriat	Other	p
MSD no	44.1%	49.2%	46.3%	50.7%	42.8%	47.7%	
Yes own diag.	28.5%	24.5%	19.1%	21.2%	25.4%	23.8%	<.001
Yes med. diag.	27.3%	26.3%	34.6%	28.1%	31.8%	28.5%	
N	6222	8135	3258	6111	4700	7896	
Burn out low or med.	65.4%	72.6%	77.7%	77.0%	67.5%	73.9%	
High	34.6%	27.4%	22.3%	23.0%	32.5%	26.1%	<.001
N	6574	9426	3226	6491	4860	7840	
Satisf phys w.or. cond	45.5%	52.6%	67.9%	65.7%	52.1%	57.3%	
Dissa-tisfied	54.5%	47.4%	32.1%	34.3%	47.9%	42.7%	<.001
N	6571	9401	3224	6493	4864	7884	
Satisf psychol.og support	43.6%	48.1%	53.8%	60.2%	47.0%	48.3%	
Dissa-tisfied	56.4%	51.9%	46.2%	39.8%	53.0%	51.7%	<.001
N	6513	9293	3164	6439	4803	7750	
Satisf Quality of care	50.7%	61.9%	63.7%	63.8%	54.0%	58.2%	
Dissa-tisfied	49.3%	38.1%	36.3%	36.2%	46.0%	41.8%	<.001
N	6490	9265	3167	6451	4815	7575	
Works pli shifts	25.2%	20.4%	37.6%	37.0%	36.5%	25.1%	<.001

In France, (as well as in Italy and Germany) HCWs are more dissatisfied with their physical working conditions, 52%, the psychological support they receive at work, 66.1% and their opportunities to give their patients the care they need, 49,5%. In French nursing homes the results are respectively 55.8%, 61% and 52.9%.

3.2 Ergonomic observations

3.2.1 *Time with residents and influence of split shifts*

We noted that HCWs in long-term care spent over 50% of their time with patients (figure 1). Only two of those who were observed spent less than 30% of their time with patients: a nurse responsible for preparating medication and a night HCW.

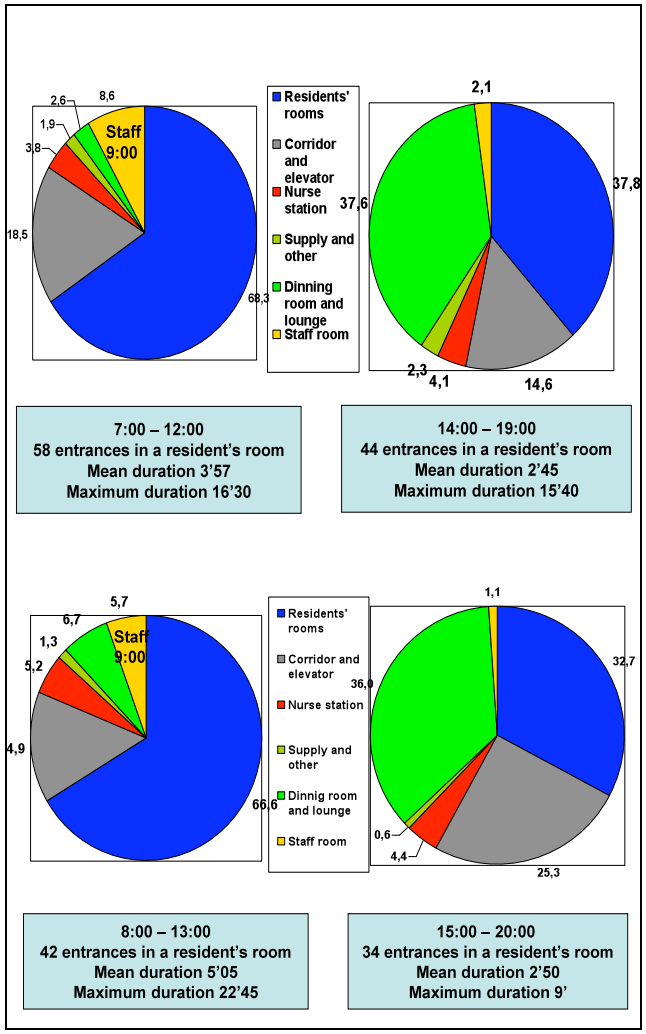

Figure 1. Percentage of time in each room during the total work post of two nursing aid working in split shift in a nursing home, in France, in 2007.

However, the possibility of adapting to the needs and rhythms of elderly patients was impaired by inadequate work schedules and inadequate space.

Split shifts and a lack of time for shift handover obliged HCWs to act without being able to adapt to patients' requests.

Indeed officially three nursing aids take care of 21 highly dependent residents (most of them classified as GIR 1-3) in each floor of a nursing home. However their schedules are split as follows :

7 h - - - - - 12 h **14 h - - - - - 19 h**
8 h - - - - - 13 h **15 h - - - - - 20 h**
9 h - - - - - 14 h **16 h - - - - - 21 h**

This means that, during 4 hours, only one nursing aid takes care of the residents (7-8 am; 1-3 pm; 8-9 pm). Two nursing aids are at work during 4 other hours. Then, three nursing aids may respond to the residents' needs only 6 hours out of 14 and the night nursing aids work alone without official handover from colleagues.

Only two pieces of equipment to lift residents are available in the nursing home with 4 floors. The nursing aids are able to change urine protections of the heaviest residents only when they collaborate with a colleague. So these changes are not possible for 4 hours (7-8 am; 1-3 pm; 8-9 pm) of the day. The night nursing aids collaborate for two floors. So they have to start changing urine protections by 5 am or even earlier. The consequence of this is that nursing aids starting at 9 am may help residents whose urine protection was changed before 5 am. The same is true for nursing aids starting at 4 pm who may help residents whose urine protection was changed before 11 am.

As there is only one night nurse, each nursing aid whose work schedule ends before 9 pm has to report to the one remaining until 9 pm. This aid must finish her work by 8 pm to receive relevant information from the others.

The night nursing aid voluntarily arrives earlier and leaves later than officially recognised to get information from the last day nursing aid and to transmit information to the first one (figure 2).

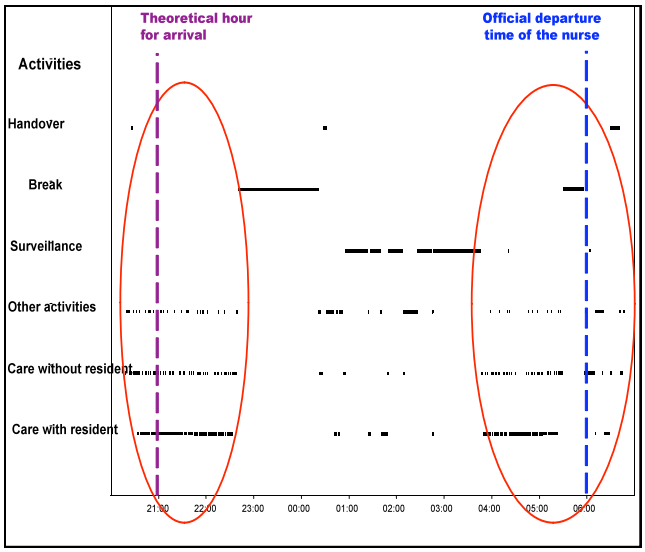

Figure 2. Real work duration and activities undertaken by a night nursing aids in a nursing home, in France, in 2007.

The activities undertaken are mostly helping the resident to eliminate, move, wash drink and eat. Nursing aids spoke with

residents each time the surrounding noise did not interfere. However, the time completely devoted to a relationship with the resident and social discussion was limited (figure 3). In this observation, only 4.4% of the total working time was spent only keeping the resident company and discussing with him or her.

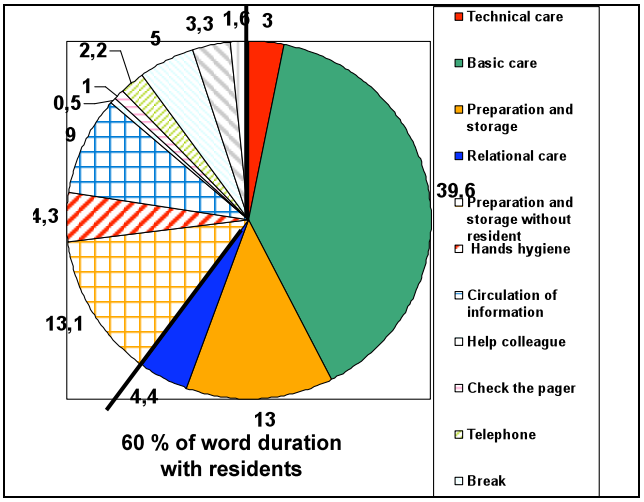

Figure 3. Content of the direct and indirect care given by a nursing aid in a nursing home, in France, in 2007.

3.2.2 *Influence of the type and location of the dinning room on the quality of care*

In the three nursing homes, the lack of a sufficient number of lifts and the decision to have only one dining room sharply reduced the time devoted to helping patients eat. A nursing aid theoretically devoting 50 minutes to help resident for their dinner, spent half of this time in corridors and escalators waiting with the residents for the next lift and putting them in it two by two (figure 3). Furthermore, the feet support of the wheel chairs had to be removed in order to allow the chair to fit in the lift.

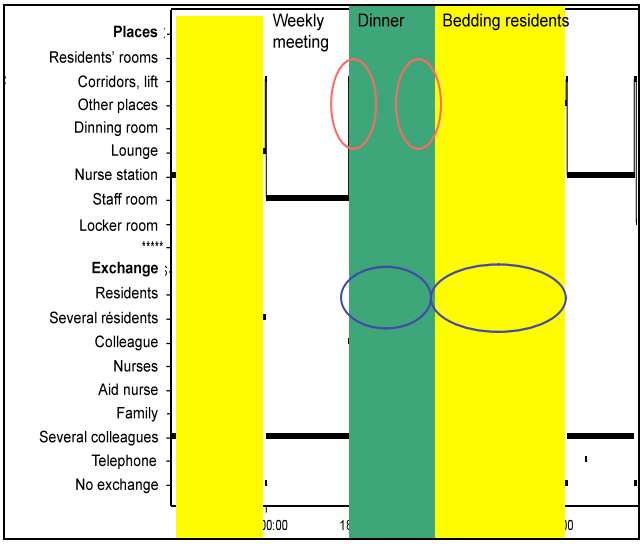

Figure 3. Influence of the absence of sufficient lift to the time devoted to help resident eating by a nursing aid in a nursing home, in France, in 2007.

This situation is also observed for the lunch. This nursing aid spent even more time (two-thirds of the lunch period) bringing residents to the dining room, since fewer residents eat lunch in their rooms (figure 4). In this figure, we also see the detailed time spent in each resident's room. Before breakfast, aids help residents to move to a chair but do not have enough time to change their protection. After the breakfast, daily care activities allow aids to stay longer in each room since there are three nursing aids work at the same floor at that time.

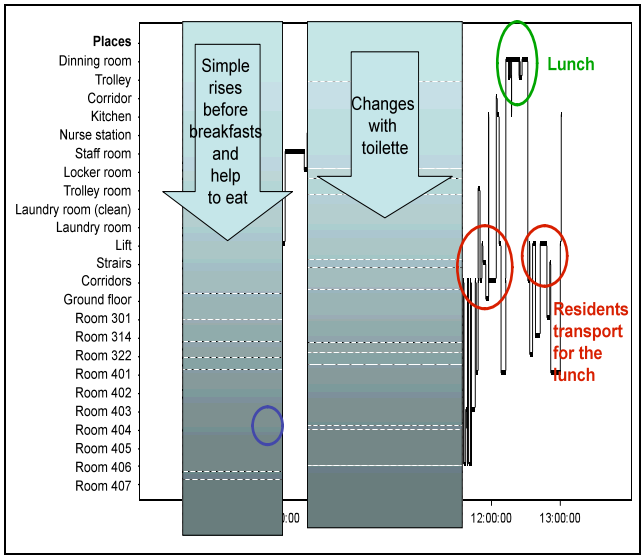

Figure 4. Influence of the absence of sufficient lift to the time devoted to help resident eating by a nursing aid in a nursing home, in France, in 2007.

3.2.3 *Influence of noise and the space to use wheel chairs*

Insufficient attention given to noise reduction did not allow for meals to be a time for pleasant conversation. We see (figure 4) that exchanges with residents are reduced in the dining room, while the same nursing aid speaks with the resident most of the time in their private room.

A dining room may have pleasant paintings. But if the floor and ceiling are prone to echo, most old persons are not able to understand conversations.

Another difficulty was that the last person installed at his table was also the first to be conducted out, as the dining room did not have sufficient space to circulate with a wheel chair when other the residents were sitting at their tables. Even the nursing aids could not come close to each resident to help them eat and had to help them from the opposite side of the table.

3.2.4 *Influence of space and furniture on HCWs' postures*

The intensity of the job is obvious when we analyzed the postures of nursing aids. Most of the hold more than 200 awkward postures (leaning or skating) or even highly detrimental ones such as lifting residents without aids (figure 5).

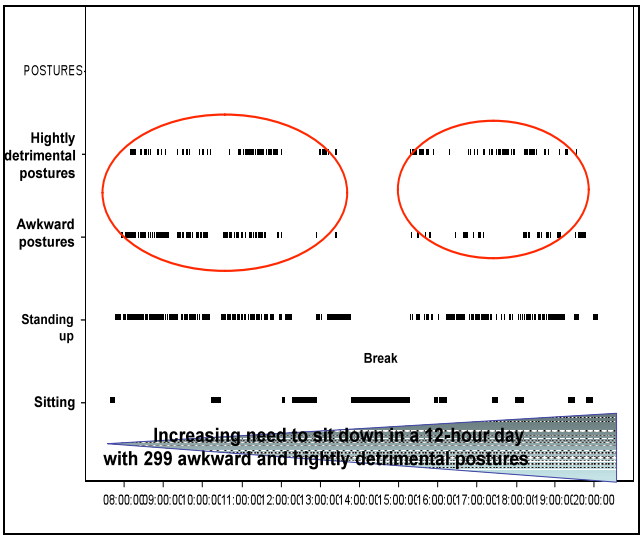

Figure 5. Repartition of the postures undertaken by a nursing aid in a nursing home, in France, in 2007.

Other observations show the frequency of awkward and highly detrimental postures (table 2)

Table 2. Frequency of detrimental and awkward postures during the post of 5 nursing aids and one nurse in nursing homes

	7 am – 7 p m	8 am – 8 p m	9 am – 9 p m		Night N aid	Nurse
Highly detrimental postures						
Number	123	259	101	138	98	35
% of working time	8.9%	20.2%	7.5%	16.6%	8.3%	11.7%
Awkward postures						
Number	161	237	105	161	96	27
% of working time	14.2%	18.8%	14.1%	17.4%	7.5%	6.1%

3.2.5 *Interruptions*

All of our observations led us to wonder about interruptions: to deal with missing or failing equipment, to search for co-workers, to be faced with conflicting tasks. We were particularly preoccupied by two special difficulties: the lack of sufficient lifts and the special organization required when dealing with mostly disabled people and an alarm system which had to give an alert in case of a problem without being too sensitive. HCWs in long-term care have to make choices between patients often means not having the time to spend with an elderly patient's need of social contact in order to take care of another one's basic needs.

3.2.6 *Lack of collective support*

The work organization let very little time for long exchanges with residents. However they exist when possible. But what seldom exist is the collective discussion to adapt an adequate attitude with each resident (table 3). The psychological support necessary to prevent burnout when working with dependant and dement patients is nearly non existent.

Table 3. Repartition of the exchanges of a nursing aid in a nursing home, in France, in 2007.

	Team members	Physician	Residents
1 min	39		78
2 min	9	1	32
3 min	1		8
4 min	1		8
5 - 8 min	2 Only at the beginning and the end of shift, during handover, in overtime		3 1 of 9 min 1 of 15 min

This is also observed in other ergonomic analysis (table 4)

Table 4. Frequency of exchanges with residents and with colleagues of HCWs in nursing homes

	7 am – 7 p m	8 am – 8 p m	9 am – 9 p m	7h45 – 20h15	Night N aid
Exchanges with residents					
Number	81	137	74	140	66
% of working time	31,3%	20,8%	23,2%	27,5%	23,2%
Exchange with colleagues of the same qualification					
Number	49	42	74	40	9
% of working time	9,9%	14,3%	23,2%	5,3%	24,1%
Exchange with HCWs of a higher qualification					
Number	10	15	9	11	0
% of working time	1,3%	1,6	2%	2%	0

3.2.7 *Observations made by HCWs following the research action session*

In each nursing home, HCWs of different qualifications observed the work of another colleague of a different qualification or schedule.

They demonstrated the permanence of difficulties under estimated for physical load (table 5).

Table 5. Frequency of detrimental and awkward postures during the post of 5 nursing aids and one nurse in nursing homes : observations made by HCWS

	NA 8:30 – 19:30	NA 7 am – 14:30	NA 7:50 – 19:30	Nurse 8 am – 7 p m
Highly detrimental postures				
Number	59	122	12	50
% of working time	22 %	10 %	4,1 %	9 %
Awkward postures				
Number	73	29	12	42
% of working time	23 %	7 %	4,3 %	8 %

They also demonstrated the lack of time to have long discussions with residents as well as with colleagues (table 6).

Table 6. Frequency of exchanges with residents and with colleagues of HCWs in nursing homes : : observations made by HCWS

	Nurse 8 am – 7 p m	Nursing aid 7:50 – 19:30
Exchanges with residents		
Number	47	19
% of working time	41%	55 %
Exchange with colleagues of the same qualification		
Number	13	13
% of working time	13%	27,8%
Exchange with HCWs of a higher qualification		
Number	0	1
% of working time	0	0,3%

These precise data helped to go beyond general complaints from HCWs, residents or family. The helped to avoid guilt. They are now the bases of discussion between HCWs and management to promote improvements to recognize the difficulty of the job and to reduce it

4 CONCLUSION

Data collected during the participatory ergonomic process are now being applied so as to organize functioning, space, furniture and supplies in a way that reduces preparation time, increases time spent with patients and decreases HCWs' health risks. The demographic trend in Europe urgently requires developing work organizations in long-term care which will respect elderly patients' needs while protecting HCWs from burnout and musculoskeletal disorders.

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