SUPPLEMENTAL TABLE 1. Behavioral and psychological symptoms patients with dementia and complications in care.

|  |  |
| --- | --- |
| Complications | Expansive symptoms |
| Aggression | Disinhibition | Irritability | Aberrant motor behavior | Nighttime disturbances |
| odds ratio (95% confidence interval) |
| Nursing |  |  |  |  |  |
|  | Fends off basic care | **30.60 (14.54 – 64.38)** | **4.14 (1.80 – 9.52)** | **6.51 (3.54 – 12.00)** | **3.29 (1.84 – 5.87)** | **1.99 (1.14 – 3.47)** |
|  | Fends off wound care | **7.16 (3.23 – 15.89)** | **8.05 (2.58 – 25.10)** | **4.43 (2.03 – 9.67)** | **9.75 (4.24 – 22.43)** | **3.57 (1.61 – 7.90)** |
|  | Fends off medication | **2.45 (1.39 – 4.31)** | 1.76 (0.77 – 4.05) | **2.45 (1.39 – 4.31)** | 1.43 (0.84 – 2.45) | 1.38 (0.84 – 2.29) |
|  | Pulls out catheters etc. | **5.26 (2.77 – 10.01)** | **3.69 (1.58 – 8.65)** | **4.00 (2.09 – 7.49)** | **5.48 (2.90 – 10.38)** | **4.78 (2.46 – 9.27)** |
|  | Food/drinks untouched | **3.34 (1.62 – 6.88)** | 1.43 (0.45 – 4.55) | 2.01 (0.97 – 4.13) | **2.11 (1.02 – 4.35)** | 1.96 (0.98 – 3.93) |
|  | Fends off feeding | **3.58 (1.48 – 8.66)** | 3.26 (0.88 – 12.06) | **3.84 (1.49 – 9.90)** | **2.70 (1.14 – 6.40)** | **2.78 (1.17 – 6.61)** |
|  | Throws food | † | **8.84 (2.20 – 35.43)** | **11.26 (2.28 – 55.65)** | **10.07 (2.04 – 49.70)** | 1.98 (0.52 – 7.57) |
|  | More time needed | **4.77 (2.41 – 9.45)** | **4.38 (1.46 – 13.13)** | **3.40 (1.80 – 6.43)** | **3.81 (2.05 – 7.08)** | **3.25 (1.89 – 5.57)** |
| Medical treatment |  |  |  |  |  |
|  | Disobeys instructions | **6.30 (2.69 – 14.76)** | **6.14 (2.32 – 16.28)** | **4.97 (2.15 – 11.49)** | **2.46 (1.08 – 5.61)** | **3.03 (1.28 – 7.16)** |
|  | Fends off blood withdrawal etc. | **9.65 (3.29 – 28.30)** | **5.95 (2.01 – 17.62)** | **5.56 (2.06 – 15.03)** | **4.52 (1.68 – 12.15)** | **2.96 (1.06 – 8.28)** |
|  | Physical restraint in bed | **4.89 (1.78 – 13.42)** | **6.33 (2.12 – 18.91)** | **4.89 (1.78 – 13.42)** | **14.54 (4.04 – 52.27)** | **5.45 (1.73 – 17.23)** |
|  | Physical restraint in chair | **4.60 (1.41 – 15.01)** | **5.34 (1.49 – 19.16)** | **6.71 (1.95 – 23.08)** | 2.71 (0.85 – 8.69) | 1.54 (0.48 – 4.90) |
|  | Application of bed rails | **1.94 (1.06 – 3.56)** | 0.98 (0.42 – 2.24) | 1.34 (0.75 – 2.40) | **2.22 (1.23 – 4.03)** | **1.90 (1.12 – 3.23)** |
|  | Transfer to single room or hall | **2.79 (1.47 – 5.29)** | **4.33 (1.86 – 10.05)** | **3.84 (2.02 – 7.27)** | **4.17 (2.21 – 7.86)** | **3.97 (2.07 – 7.61)** |
|  | Neurologic/psychiatric consult | **2.18 (1.02 – 4.67)** | **3.06 (1.18 – 7.97)** | **2.18 (1.02 – 4.67)** | **2.79 (1.33 – 5.87)** | **2.45 (1.15 – 5.22)** |
| Medication |  |  |  |  |  |
|  | Antipsychotics | **2.25 (1.24 – 4.09)** | 2.21 (0.96 – 5.08) | **1.82 (1.00 – 3.30)** | **2.90 (1.63 – 5.17)** | 1.47 (0.85 – 2.56) |
|  | Anxiolytics | **2.81 (1.15 – 6.85)** | 1.52 (0.42 – 5.54) | 2.23 (0.91 – 5.49) | **4.24 (1.73 – 10.40)** | **7.55 (2.46 – 23.17)** |
|  | Antidepressants | 0.48 (0.22 – 1.03) | 0.83 (0.30 – 2.29) | 0.54 (0.26 – 1.14) | 0.75 (0.38 – 1.46) | 1.23 (0.67 – 2.25) |
|  | Hypnotics/sedatives | 0.96 (0.37 – 2.51) | 2.63 (0.90 – 7.73) | **2.61 (1.12 – 6.07)** | 1.49 (0.63 – 3.54) | **4.97 (1.89 – 13.08)** |
|  | Anti-dementia drugs | 1.16 (0.43 – 3.09) | 0.42 (0.05 – 3.25) | 0.87 (0.31 – 2.45) | 2.30 (0.95 – 5.57) | 2.16 (0.88 – 5.34) |
|  | Antiepileptics | 0.85 (0.37 – 1.97) | 1.61 (0.57 – 4.59) | 0.69 (0.29 – 1.65) | 0.70 (0.30 – 1.60) | 1.16 (0.57 – 2.40) |
|  | Analgetics | 0.84 (0.48 – 1.47) | **0.35 (0.14 – 0.87)** | 0.88 (0.51 – 1.53) | 0.66 (0.38 – 1.12) | 0.81 (0.49 – 1.34) |
| Behaviors |  |  |  |  |
|  | Other patients complain | **4.88 (2.39 – 9.98)** | **3.87 (1.53 – 9.81)** | **6.25 (3.02 – 12.94)** | **2.86 (1.41 – 5.81)** | **7.69 (3.52 – 16.81)** |
|  | Rings bell very often | **2.65 (1.31 – 5.33)** | 1.84 (0.69 – 4.92) | **5.00 (2.47 – 10.09)** | 1.47 (0.72 – 3.01) | **2.64 (1.32 – 5.26)** |
|  | Experienced fall | 1.50 (0.64 – 3.48) | 1.66 (0.53 – 5.22) | 1.50 (0.64 – 3.48) | 1.78 (0.79 – 4.00) | 1.35 (0.61 – 2.97) |
|  | Shouts/calls for help | **11.40 (5.60 – 23.22)** | **5.09 (2.18 – 11.92)** | **7.80 (3.94 – 15.46)** | **7.79 (3.92 – 15.50)** | **4.75 (2.39 – 9.44)** |
|  | Insults others | † | **5.86 (2.23 – 15.42)** | **14.52 (5.51 – 38.23)** | **4.18 (1.82 – 9.61)** | **2.73 (1.19 – 6.29)** |
|  | Physically aggressive | **195.09 (25.82–1474.12)** | **8.61 (3.55 – 20.90)** | **6.64 (3.09 – 14.24)** | **4.03 (1.92 – 8.44)** | **2.28 (1.09 – 4.78)** |
|  | Gets lost on ward | 2.04 (0.70 – 5.91) | 1.10 (0.19 – 6.37) | 0.86 (0.31 – 2.40) | **7.56 (2.70 – 21.18)** | **4.63 (1.73 – 12.42)** |
|  | Leaves ward/hospital | **4.44 (1.43 – 13.73)** | 3.40 (0.69 – 16.81) | 1.40 (0.46 – 4.24) | **8.92 (2.83 – 28.18)** | **5.18 (1.53 – 17.53)** |

*Note*. † Empty cell: care relevant outcome not reported for patients without respective symptom.

SUPPLEMENTAL TABLE 1 CONTINUED. Behavioral and psychological symptoms patients in patients with dementia and complications in care.

|  |  |  |  |
| --- | --- | --- | --- |
| Complications | Psychotic symptoms |  | Affective symptoms |
| Delusions | Hallucinations |  | Depression | Anxiety | Apathy |
| odds ratio (95% confidence interval) |  | odds ratio (95% confidence interval) |
| Nursing |  |  |  |  |  |  |
|  | Fends off basic care | **3.30 (1.15 – 9.47)** | 3.61 (0.94 – 13.87) |  | 1.29 (0.72 – 2.31) | **3.36 (1.86 – 6.05)** | 1.74 (0.93 – 3.26) |
|  | Fends off wound care | 1.60 (0.31 – 8.31) | 2.47 (0.22 – 28.05) |  | 0.90 (0.39 – 2.08) | 1.46 (0.67 – 3.20) | 1.12 (0.47 – 2.68) |
|  | Fends off medication | 1.16 (0.41 – 3.31) | 1.08 (0.28 – 4.11) |  | 1.00 (0.59 – 1.72) | 1.52 (0.87 – 2.65) | 1.55 (0.86 – 2.80) |
|  | Pulls out catheters etc. | 1.42 (0.43 – 4.71) | 1.15 (0.23 – 5.86) |  | 1.18 (0.61 – 2.27) | 1.64 (0.86 – 3.14) | 1.31 (0.66 – 2.60) |
|  | Food/drinks untouched | **5.45 (1.85 – 16.09)** | 2.87 (0.68 – 12.02) |  | 1.86 (0.92 – 3.78) | 1.95 (0.94 – 4.07) | **3.88 (1.82 – 8.29)** |
|  | Fends off feeding | 3.60 (0.62 – 20.82) | 0.83 (0.72 – 9.50) |  | 2.10 (0.85 – 5.18) | **3.60 (1.39 – 9.36)** | 1.67 (0.69 – 4.04) |
|  | Throws food | **6.08 (1.12 – 33.10)** | 4.29 (0.47 – 39.09) |  | 3.13 (0.82 – 11.97) | **6.54 (1.59 – 26.97)** | 1.93 (0.47 – 7.99) |
|  | More time needed | **11.53 (1.49 – 89.03)** | 2.76 (0.56 – 13.53) |  | 1.04 (0.61 – 1.78) | **1.87 (1.05 – 3.34)** | **2.26 (1.20 – 4.28)** |
| Medical treatment |  |  |  |  |  |  |
|  | Disobeys instructions | 0.68 (0.09 – 5.40) | 1.17 (0.14 – 9.77) |  | 1.14 (0.47 – 2.76) | 1.45 (0.60 – 3.54) | 1.79 (0.73 – 4.36) |
|  | Fends off blood withdrawal etc. | **4.18 (1.05 – 16.61)** | 4.78 (0.91 – 25.15) |  | 0.51 (0.14 – 1.84) | **3.28 (1.24 – 8.66)** | 1.08 (0.34 – 3.43) |
|  | Physical restraint in bed | 1.05 (0.13 – 8.45) | 4.90 (0.93 – 25.79) |  | 1.11 (0.37 – 3.30) | 2.13 (0.78 – 5.85) | 1.15 (0.36 – 3.67) |
|  | Physical restraint in chair | 1.55 (0.19 – 12.89) | 2.76 (0.32 – 24.06) |  | 1.22 (0.36 – 4.19) | 0.96 (0.25 – 3.65) | 1.25 (0.33 – 4.77) |
|  | Application of bed rails | 1.77 (0.55 – 5.73) | 5.20 (0.64 – 42.17) |  | 0.91 (0.53 – 1.57) | **2.28 (1.23 – 4.22)** | **1.97 (1.03 – 3.76)** |
|  | Transfer to single room or hall | 2.21 (0.72 – 6.76) | 2.19 (0.53 – 9.08) |  | 0.69 (0.34 – 1.40) | 1.70 (0.89 – 3.27) | 0.99 (0.47 – 2.07) |
|  | Neurologic/psychiatric consult | 1.97 (0.53 – 7.42) | **6.70 (1.70 – 26.46)** |  | 1.45 (0.67 – 3.11) | 2.07 (0.97 – 4.42) | 1.49 (0.65 – 3.42) |
| Medication |  |  |  |  |  |  |
|  | Antipsychotics | **9.01 (2.76 – 29.36)** | 2.40 (0.63 – 9.22) |  | 0.97 (0.53 – 1.77) | 1.75 (0.97 – 3.18) | 1.19 (0.62 – 2.31) |
|  | Anxiolytics | 1.75 (0.37 – 8.32) | 3.50 (0.68 – 18.06) |  | 1.47 (0.59 – 3.66) | 1.40 (0.55 – 3.59) | 0.84 (0.27 – 2.59) |
|  | Antidepressants | 0.24 (0.03 – 1.86) | ‡ |  | **1.91 (1.04 – 3.52)** | 1.70 (0.91 – 3.18) | 1.11 (0.55 – 2.24) |
|  | Hypnotics/sedatives | ‡ | 1.19 (0.14 – 9.90) |  | **2.54 (1.10 – 5.85)** | 1.15 (0.46 – 2.88) | 0.96 (0.34 – 2.67) |
|  | Anti-dementia drugs | 1.85 (0.39 – 8.83) | 1.45 (0.17 – 12.18) |  | 0.93 (0.35 – 2.47) | 1.75 (0.70 – 4.38) | 0.58 (0.17 – 2.05) |
|  | Antiepileptics | 1.63 (0.44 – 6.08) | 0.78 (0.09 – 6.39) |  | 0.99 (0.45 – 2.18) | 1.89 (0.89 – 4.00) | 1.33 (0.59 – 3.03) |
|  | Analgetics | 0.90 (0.32 – 2.57) | 0.51 (0.12 – 2.08) |  | 1.28 (0.75 – 2.17) | 0.79 (0.45 – 1.37) | 1.01 (0.56 – 1.83) |
| Behaviors |  |  |  |  |  |
|  | Other patients complain | 3.13 (0.97 – 10.10) | **8.52 (1.95 – 37.24)** |  | 1.28 (0.63 – 2.63) | 1.93 (0.94 – 3.96) | 0.89 (0.38 – 2.07) |
|  | Rings bell very often | 2.16 (0.65 – 7.16) | 1.68 (0.34 – 8.38) |  | 1.56 (0.77 – 3.16) | 1.29 (0.61 – 2.69) | 1.09 (0.49 – 2.44) |
|  | Experienced fall | **3.59 (1.06 – 12.18)** | 2.62 (0.52 – 13.29) |  | 1.17 (0.50 – 2.71) | 1.42 (0.61 – 3.31) | 1.56 (0.65 – 3.75) |
|  | Shouts/calls for help | **6.38 (2.18 – 18.62)** | **19.90 (3.98 – 99.42)** |  | 1.32 (0.67 – 2.57) | **2.91 (1.51 – 5.62)** | 1.34 (0.64 – 2.79) |
|  | Insults others | **5.70 (1.78 – 18.31)** | **14.50 (3.61 – 58.32)** |  | 1.36 (0.58 – 3.20) | 1.96 (0.84 – 4.56) | 0.86 (0.31 – 2.39) |
|  | Physically aggressive | **7.54 (2.53 – 22.48)** | **10.51 (2.66 – 41.52)** |  | 1.46 (0.68 – 3.12) | **3.74 (1.77 – 7.91)** | 0.95 (0.39 – 2.32) |
|  | Gets lost on ward | **10.00 (1.06 – 94.11)** | † |  | 0.94 (0.34 – 2.62) | 1.82 (0.64 – 5.19) | 1.53 (0.40 – 5.91) |
|  | Leaves ward/hospital | **20.29 (2.11 – 195.38)** | † |  | 1.15 (0.36 – 3.69) | 2.27 (0.72 – 7.16) | 1.86 (0.43 – 8.03) |

*Note*. † Empty cell: care relevant outcome not reported for patients without respective symptom. ‡ Empty cell: care relevant outcome not reported for patients with respective symptom.

SUPPLEMENTAL TABLE 2. Frequency of behavioral and psychological symptoms in patients with and without dementia as reported by nursing staff with delirium cases excluded.

|  |  |  |  |
| --- | --- | --- | --- |
| Symptom | Dementia*N*=210† |  | No dementia*N*=1,170+ |
| *N* | % (95% CI) |  | *N* | % (95% CI) |
| Delusions\*\*\* | 11 | 5.2 (3.0 – 9.1) |  | 14 | 1.2 (0.7 – 2.0) |
| Hallucinations\*\*\* | 7 | 3.3 (1.6 – 6.7) |  | 7 | 0.6 (0.3 – 1.2) |
| Aggression\*\*\* | 44 | 21.0 (16.0 – 27.0) |  | 44 | 3.8 (2.8 – 5.0) |
| Depression\*\*\* | **61** | **29.0 (23.3 – 35.5)** |  | **213** | **18.2 (16.1 – 20.5)** |
| Anxiety\*\*\* | 47 | 22.4 (17.3 – 28.5) |  | 125 | 10.7 (9.0 – 12.6) |
| Euphoria | 1 | 0.5 (0.1 – 2.6) |  | 16 | 1.4 (0.8 – 2.2) |
| Apathy\*\*\* | 42 | 20.0 (15.2 – 25.9) |  | 34 | 2.9 (2.1 – 4.0) |
| Disinhibition\*\*\* | 18 | 8.6 (5.5 – 13.1) |  | 25 | 2.1 (1.5 – 3.1) |
| Irritability\*\*\* | **51** | **24.3 (19.0 – 30.5)** |  | **142** | **12.1 (10.4 – 14.1)** |
| Aberrant motor behavior\*\*\* | 46 | 21.9 (16.8 – 28.0) |  | 28 | 2.4 (1.7 – 3.4) |
| Nighttime disturbances\*\*\* | **74** | **35.2 (29.1 – 41.9)** |  | **137** | **11.7 (10.0 – 13.7)** |
| ≥ 1 symptom\*\*\* | 154 | 73.3 (67.0 – 78.9) |  | 429 | 36.7 (34.0 – 39.5) |

*Note.* 95 % CI = 95 % confidence interval according to the Wilson score method*.*

† Of the original 270 patients with dementia 48 had a comorbid delirium and for 12 delirium could not be ruled in or out due to insufficient information.

+ Of the original 1,199 patients without dementia 27 had delirium and for 2 delirium could not be ruled in or out due to insufficient information.

Comparisons with χ2-tests: \*\*\* *p*<0.001.

Three most frequent symptoms in each group are in boldface.