

Supplementary Online Content

Fritz BA, King CR, Mehta D, et al; ENGAGES Research Group. Association of a perioperative multicomponent fall prevention intervention with falls and quality of life after elective inpatient surgical procedures. *JAMA Netw Open*. 2022;5(3):e221938. doi:10.1001/jamanetworkopen.2022.1938

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This supplementary material has been provided by the authors to give readers additional information about their work.

eTable 1. Preoperative and Surgical Characteristics of All Patients Meeting Eligibility Criteria (Matched and Unmatched; N = 2013)

| Variable | Intervention Cohort (N = 970) | Control Cohort (N = 1,043) | P |
|-------------------------------------|----------------------------------|-------------------------------|---------|
| Age | 69 [64 to 74] | 68 [64 to 74] | 0.34 |
| Sex | | | |
| Female | 435 (45%) | 541 (52%) | 0.002 |
| Male | 535 (55%) | 502 (48%) | |
| Race | | | |
| American Indian or Alaska Native | 0 (0%) | 1 (< 1%) | 0.15 |
| Asian | 3 (< 1%) | 3 (< 1%) | |
| Black or African American | 82 (8%) | 66 (6%) | |
| Native Hawaiian or Pacific Islander | 2 (< 1%) | 0 (0%) | |
| White | 879 (91%) | 897 (86%) | |
| Other | 4 (< 1%) | 0 (0%) | |
| Unknown | 0 (0%) | 76 (7%) | |
| Ethnicity | | | |
| Hispanic or Latino | 9 (1%) | 7 (1%) | 0.78 |
| Not Hispanic or Latino | 957 (99%) | 968 (93%) | |
| Unknown | 4 (< 1%) | 68 (6%) | |
| ASA Physical Status | | | |
| 1 | 6 (1%) | 2 (< 1%) | < 0.001 |
| 2 | 150 (15%) | 303 (29%) | |
| 3 | 487 (50%) | 597 (57%) | |
| 4 | 327 (34%) | 140 (13%) | |
| 5 | 0 (0%) | 1 (< 1%) | |
| Number of Comorbid Conditions | 4 [3 to 6] | 3 [2 to 5] | < 0.001 |
| Preoperative Short Blessed Test | 2 [0 to 4] | 2 [0 to 4] | 0.70 |
| Preoperative functional capacity | | | |
| 6-10 METs | 18 (2%) | 30 (3%) | < 0.001 |
| 4-6 METs | 468 (50%) | 601 (59%) | |
| < 4 METs | 435 (47%) | 385 (38%) | |
| Unable to assess | 11 (1%) | 4 (< 1%) | |
| History of Falls | 205 (21%) | 236 (23%) | 0.45 |
| Preoperative PCS-12 | 38.5 [29.3 to 47.9] | 41.4 [32.2 to 50.8] | < 0.001 |
| Preoperative MCS-12 | 57.5 [48.7 to 61.7] | 56.9 [47.5 to 61] | 0.11 |
| Surgical Service | | | |
| Cardiothoracic | 426 (44%) | 227 (22%) | < 0.001 |
| Gastrointestinal | 122 (12%) | 249 (24%) | |
| Gynecologic | 84 (9%) | 94 (9%) | |
| Hepatobiliary | 103 (11%) | 85 (8%) | |
| Urology | 72 (7%) | 112 (11%) | |
| Vascular | 86 (9%) | 76 (7%) | |
| Other | 77 (8%) | 200 (19%) | |
| Duration of Anesthesia (min) | 310 [230 to 396] | 245 [181 to 338] | < 0.001 |

Abbreviations: ASA = American Society of Anesthesiologists. METs = metabolic equivalents. PCS-12 = physical composite summary. MCS-12 = mental composite summary

eTable 2. Preoperative Home Medications, Changes Recommended by the Geriatric Psychiatrist, and Postoperative Discharge Medications in the Intervention Group (n = 698)

| Medication Class | Number of Patients Taking Medication Preoperatively | Number of Patients with Change Recommendations | | | | | | Number of Patients Prescribed Medication at Hospital Discharge |
|--|---|--|------------------------|-------------|--------------------|-----------------|-----------|--|
| | | Any Rec ^a | Discontinue Medication | Reduce Dose | Replace Medication | Change Schedule | Other Rec | |
| Any Medication | 690 (99%) | 213 | 188 | 34 | 46 | 2 | 7 | 697 (100%) |
| ACE inhibitor | 217 (31%) | 0 | 0 | 0 | 0 | 0 | 0 | 162 (23%) |
| Acetylcholinesterase inhibitor for dementia | 3 (0%) | 0 | 0 | 0 | 0 | 0 | 0 | 2 (0%) |
| Acetylcholinesterase inhibitor for myasthenia gravis | 0 (0%) | 0 | 0 | 0 | 0 | 0 | 0 | 1 (0%) |
| Alpha-1 blocker | 75 (11%) | 1 | 1 | 1 | 0 | 0 | 0 | 111 (16%) |
| Alpha-2 agonist | 18 (3%) | 0 | 0 | 0 | 0 | 0 | 0 | 14 (2%) |
| Amphetamines | 1 (0%) | 0 | 0 | 0 | 0 | 0 | 0 | 0 (0%) |
| Analgesic- non-opioid | 538 (77%) | 16 | 15 | 1 | 0 | 0 | 0 | 662 (95%) |
| Analgesic- opioid | 155 (22%) | 4 | 3 | 3 | 1 | 0 | 1 | 600 (86%) |
| Angiotensin II receptor blocker | 126 (18%) | 1 | 1 | 0 | 0 | 0 | 0 | 87 (12%) |
| Anti-anxiety-other | 4 (1%) | 1 | 1 | 0 | 0 | 0 | 0 | 6 (1%) |
| Anti-cholinergic antispasmodics | 48 (7%) | 16 | 16 | 0 | 5 | 0 | 0 | 44 (6%) |
| Antidepressant-Other | 28 (4%) | 2 | 2 | 1 | 1 | 0 | 1 | 23 (3%) |
| Anti-parkinson medications | 23 (3%) | 0 | 0 | 0 | 0 | 0 | 0 | 20 (3%) |
| Antiarrhythmic | 29 (4%) | 0 | 0 | 0 | 0 | 0 | 0 | 63 (9%) |
| Anticoagulant | 92 (13%) | 0 | 0 | 0 | 0 | 0 | 0 | 253 (36%) |
| Anticonvulsant | 86 (12%) | 0 | 0 | 0 | 0 | 0 | 0 | 133 (19%) |
| Antiplatelet agent | 70 (10%) | 0 | 0 | 0 | 0 | 0 | 0 | 78 (11%) |
| Antipsychotics | 25 (4%) | 10 | 10 | 1 | 0 | 0 | 0 | 32 (5%) |
| Benzodiazepines | 100 (14%) | 78 | 65 | 25 | 2 | 1 | 2 | 106 (15%) |
| Beta blocker | 304 (44%) | 0 | 0 | 0 | 0 | 0 | 0 | 351 (50%) |
| Calcium channel blocker | 199 (29%) | 0 | 0 | 0 | 0 | 0 | 0 | 182 (26%) |
| Diuretic | 260 (37%) | 1 | 1 | 0 | 0 | 0 | 0 | 307 (44%) |

| | | | | | | | | |
|---|-----------|----|----|---|----|---|---|------------|
| H1-antihistamine | 132 (19%) | 65 | 60 | 0 | 8 | 0 | 3 | 114 (16%) |
| H2-antihistamine | 62 (9%) | 43 | 33 | 0 | 28 | 0 | 0 | 95 (14%) |
| Hypoglycemics | 174 (25%) | 0 | 0 | 0 | 0 | 0 | 0 | 177 (25%) |
| Immunosuppressant | 61 (9%) | 0 | 0 | 0 | 0 | 0 | 0 | 68 (10%) |
| Monoamine oxygenase inhibitors (MAOI) | 0 (0%) | 0 | 0 | 0 | 0 | 0 | 0 | 0 (0%) |
| Muscle relaxants | 33 (5%) | 16 | 14 | 2 | 1 | 0 | 2 | 41 (6%) |
| Nitrates | 62 (9%) | 0 | 0 | 0 | 0 | 0 | 0 | 42 (6%) |
| NMDA blocker for dementia | 0 (0%) | 0 | 0 | 0 | 0 | 0 | 0 | 0 (0%) |
| Nonbenzodiazepine hypnotic | 21 (3%) | 12 | 9 | 7 | 0 | 0 | 0 | 19 (3%) |
| Serotonergic antidepressants | 147 (21%) | 3 | 2 | 0 | 0 | 1 | 0 | 150 (21%) |
| Statin | 366 (52%) | 0 | 0 | 0 | 0 | 0 | 0 | 396 (57%) |
| Tricyclic antidepressants | 25 (4%) | 17 | 15 | 0 | 2 | 0 | 1 | 22 (3%) |
| Vasodilators-Other | 52 (7%) | 0 | 0 | 0 | 0 | 0 | 0 | 35 (5%) |
| Other | 643 (92%) | 15 | 14 | 0 | 2 | 0 | 0 | 690 (99%) |
| Medications per Patient, <i>median</i> [<i>interquartile range</i>] | 10 [6-14] | | | | | | | 13 [10-17] |

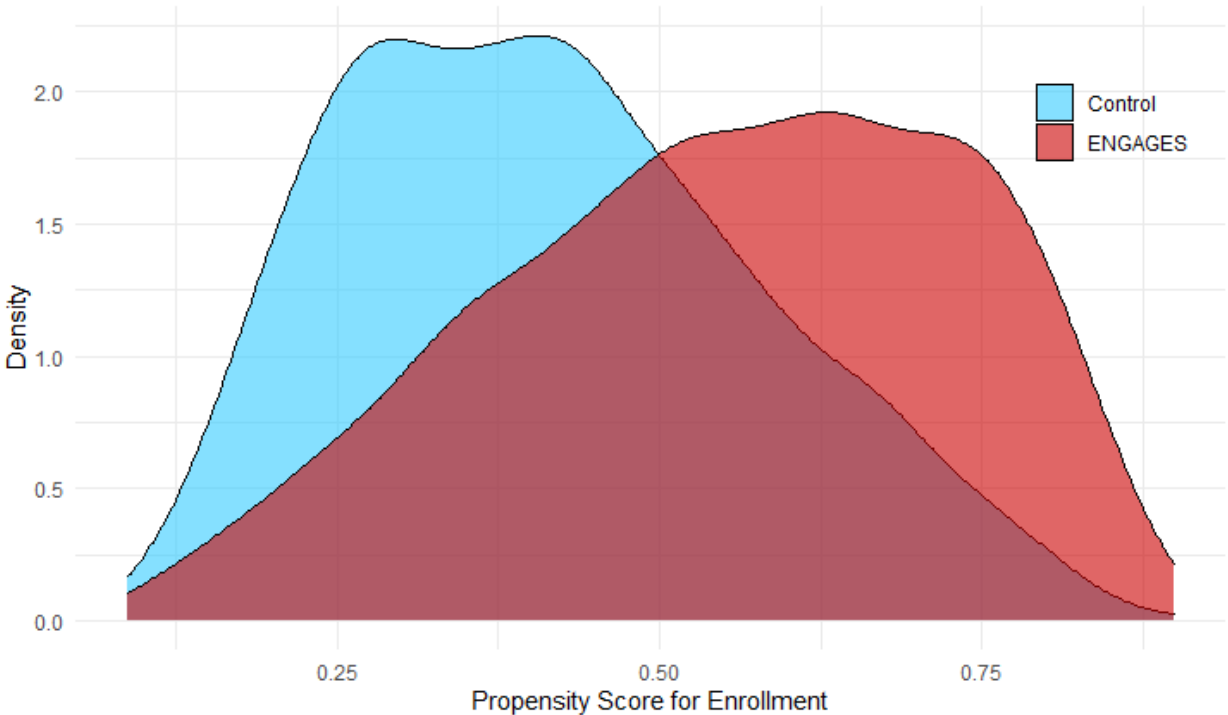
Abbreviation: Rec = recommendation

a – The number in this column may be different from the sum of the following five columns because some patients had more than one recommendation for the same medication, or they had recommendations for more than one medication in the same class.

eTable 3. Quantile Regression Coefficients

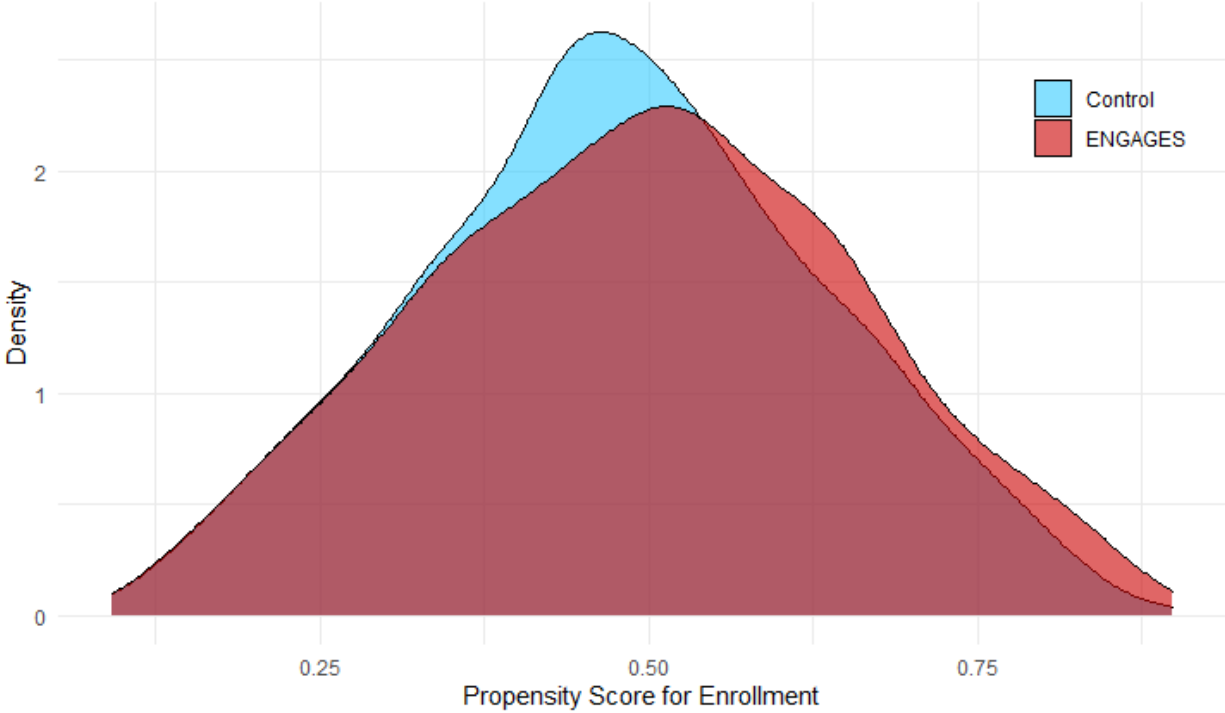
| Outcome | Predictor | Coefficient | Standard Error | P |
|-------------------|---------------------|--------------------|-----------------------|----------|
| PCS-12 at 30 days | Intercept | 22.35 | 1.43 | < 0.001 |
| | Enroll in ENGAGES | -0.65 | 0.75 | 0.38 |
| | Preoperative PCS-12 | 0.37 | 0.03 | < 0.001 |
| MCS-12 at 30 days | Intercept | 28.90 | 1.96 | < 0.001 |
| | Enroll in ENGAGES | 6.66 | 0.45 | < 0.001 |
| | Preoperative MCS-12 | 0.38 | 0.03 | < 0.001 |
| PCS-12 at 1 year | Intercept | 13.41 | 1.42 | < 0.001 |
| | Enroll in ENGAGES | 3.75 | 0.69 | < 0.001 |
| | Preoperative PCS-12 | 0.66 | 0.03 | < 0.001 |
| MCS-12 at 1 year | Intercept | 33.14 | 1.46 | < 0.001 |
| | Enroll in ENGAGES | 5.68 | 0.50 | < 0.001 |
| | Preoperative MCS-12 | 0.35 | 0.03 | < 0.001 |

eFigure 1. Distribution of Propensity Scores Among All Patients Meeting Eligibility Criteria (Matched and Unmatched; N = 2013)



Density plot of propensity score for enrollment in the ENGAGES trial among all patients in the control (N = 1,043) and intervention groups (N = 970) who met the ENGAGES inclusion criteria, had one-year falls data available, and had no missing data for any of the variables in the propensity model.

eFigure 2. Distribution of Propensity Scores Among Matched Patients (n = 1396)



Density plot of propensity score for enrollment in the ENGAGES trial among matched patients in the control and intervention groups. The median pairwise difference in propensity scores was 0.016 (interquartile range 0.001 to 0.028).