Appendix: Detailed Text Description of the Results

Total DASH Score

Univariate analysis revealed significant associations between the total DASH score and flexion, extension, pronation, supination, time since the last surgery, pain, country of residence (all $p < 0.001$), number of operations, associated injuries, and distal humeral fracture (all $p < 0.05$).

The best multivariate model based on all variables found to be significant or nearly significant in the univariate analysis included flexion, extension, pronation, pain, and presence of a distal humeral fracture and accounted for 53% of the variability in the DASH scores. The model without pain included flexion, extension, pronation, time since the last surgery, and presence of a distal humeral fracture and accounted for 37% of the variation in the total DASH score. The model with pain alone accounted for 41% of the variability in the total DASH score. A model with the four motion variables alone accounted for 35% of the variability in the total DASH score. Multivariate analysis of variance indicated significance of $p < 0.001$ for each of the four models.

Question 1: Opening a Tight or New Jar

Univariate analysis showed significant relationships between difficulty with opening a tight or new jar and flexion, extension, pronation, supination, time since the last surgery, pain, country of residence (all $p < 0.001$), associated injuries, presence of a distal humeral fracture (both $p < 0.01$), age at the time of follow-up, number of operations, and limb dominance (all $p < 0.05$). It showed a nearly significant relationship with ulnar neuropathy ($p < 0.10$).

The multivariate model based on all significant and nearly significant variables in the univariate analysis included pronation, supination, pain, and limb dominance and accounted for 35% of the variability in the outcome scores for question 1. The model without pain included flexion, supination, number of operations, and associated injuries and accounted for 26% of the variability in the outcome scores for question 1. The model with pain alone accounted for 24% of the variability in the outcome scores. A model with pronation alone accounted for 11% of the variability in the outcome scores. Multivariate analysis of variance indicated significance of $p < 0.001$ for each of the four models.

Question 2: Turning a Key

Univariate analysis showed a significant correlation of difficulty with turning a key with flexion, extension, pronation, supination, time since the last surgery, pain, associated injuries (all $p < 0.001$), country of residence, and limb dominance (both $p < 0.01$) and a nearly significant association with age and presence of a distal humeral fracture (both $p < 0.10$).

The multivariate model based on all significant and nearly significant predictors included flexion, supination, pain, associated injuries, and limb dominance and accounted for 27% of the variability in the outcome scores for question 2. The model without pain included flexion, supination, associated injuries, and limb dominance and accounted for 25% of the variability in the outcome scores. The model with pain alone accounted for 10% of the variability in the outcome scores for this question. A model with supination alone accounted for 12% of the variability in the outcome scores for this question. Multivariate analysis of variance indicated significance of $p < 0.001$ for each of the four models.

Question 3: Pushing Open a Heavy Door

Univariate analysis demonstrated a significant correlation of pushing open a heavy door with flexion, extension, supination, pain, pronation (all $p < 0.001$), time since the last surgery, country of residence (both $p < 0.01$), limb dominance, associated injuries, presence of a distal humeral fracture, and secondary gain (all $p < 0.05$).

The multivariate model based on all significant predictors included flexion, pain, and limb dominance, and this model accounted for 35% of the variability in the outcome scores for question 3. The model without pain included flexion, extension, limb dominance, presence of a distal humeral fracture, and secondary gain and accounted for 24% of the variability. The model with pain alone accounted for 25% of the variability in the outcome scores for this question. A model with extension alone accounted for 12% of the variability in the scores for this question. Multivariate analysis of variance indicated significance of $p < 0.001$ for each of the four models.

Question 4: Placing an Object on a Shelf Above the Head

In the univariate analysis, placing an object on an overhead shelf was associated with flexion, extension, pronation, time since the last surgery, pain, country of residence, and supination (all $p < 0.001$). There was a nearly significant association with associated injuries ($p < 0.10$).

The multivariate model based on all significant and nearly significant predictors included extension and pain and accounted for 40% of the variability in the question-4 scores. The model without pain included extension, pronation, and time since the last surgery, and this model accounted for 28% of the variability in the outcome scores. The model with pain alone accounted for 28% of the variability in the outcome scores. A

model with extension alone accounted for 25% of the variability in the outcome scores. Multivariate analysis of variance indicated significance of $p < 0.001$ for each of the four models.

Question 5: Changing a Light Bulb Overhead

The univariate analysis showed that difficulty with changing a light bulb overhead was associated with flexion, extension, pronation, supination, time since the last surgery, pain, country of residence (all $p < 0.001$), associated injuries, presence of a distal humeral fracture (both $p < 0.05$), and limb dominance ($p < 0.10$).

The multivariate model based on all significant and nearly significant predictors included extension, pain, and limb dominance and accounted for 35% of the variability in the outcome scores for this question. The model without pain included extension, time since the last surgery, and associated injuries, and this model accounted for 28% of the variability in the outcome scores for this question. The model with pain alone accounted for 19% of the variability in the scores, and the model with extension alone accounted for 24% of the variability in the scores. Multivariate analysis of variance indicated significance of $p < 0.001$ for each of the four models.

Question 6: Washing or Blow-Drying Hair

The univariate analysis demonstrated a significant correlation between difficulty with washing or blow-drying hair and flexion, extension, supination, time since the last surgery, pain, country of residence (all $p < 0.001$), pronation ($p < 0.01$), age, and associated injuries (both $p < 0.05$).

On the basis of all significant predictors, the multivariate model included flexion, extension, pain, and age and accounted for 41% of the variability in the outcome scores for question 6. The model without pain included flexion, extension, associated injuries, and time since the last surgery and accounted for 38% of the variability in the outcome scores for question 6. The model with pain alone accounted for 21% of the variability in the outcome scores. A model with flexion alone accounted for 28% of the variability in the scores. Multivariate analysis of variance indicated significance of $p < 0.001$ for each of the four models.

Question 7: Washing the Back

The univariate analysis demonstrated a significant correlation between difficulty with washing the back and flexion, extension, pronation, supination, time since the last surgery, pain, country of residence (all $p < 0.001$), number of operations, and associated injuries (both $p < 0.05$). There was a nearly significant association with sex and ulnar neuropathy (both $p < 0.10$).

On the basis of all significant and nearly significant predictors, the multivariate model included pain, flexion, and extension and accounted for 39% of the variability in the outcome scores for question 7. The model without pain included flexion, extension, associated injuries, and time since the last surgery and accounted for 35% of the variability in the outcome scores. The model with pain alone accounted for 21% of the variability in the outcome scores. A model with flexion and extension accounted for 33% of the variability. Multivariate analysis of variance indicated significance of $p < 0.001$ for each of the four models.

Question 8: Putting on a Pullover Sweater

The univariate analysis showed a correlation between putting on a pullover sweater and flexion, extension, pronation, supination, time since the last surgery, pain, country of residence (all $p < 0.001$), and associated injuries ($p < 0.05$).

On the basis of all significant predictors, the multivariate model included flexion, extension, and pain and accounted for 39% of the variability in the outcome scores for question 8. The model without pain included flexion, extension, and time since the last surgery and accounted for 31% of the variability in the outcome scores for this question. The model with pain alone accounted for 27% of the variability in the outcome scores for question 8. A model with flexion and extension accounted for 28% of the variability in the outcome scores. Multivariate analysis of variance indicated significance of $p < 0.001$ for each of the four models.

Question 9: Perceived Stiffness

The univariate analysis showed significant or nearly significant association between perceived stiffness and flexion, extension, pronation, supination, pain, country of residence, time since the last surgery (all $p < 0.001$), associated injuries, and presence of a distal humeral fracture (both $p < 0.10$).

The multivariate model based on all significant and nearly significant predictors included flexion, pronation, pain, and country of residence and accounted for 48% of the variability in the outcome scores for question 9. The model without pain included flexion, pronation, and country of residence and accounted for 33% of the variability in the outcome scores for this question. The model with pain alone accounted for 37% of the variability, whereas a model with flexion, extension, pronation, and supination accounted

for 31% of the variability. Multivariate analysis of variance indicated significance of $p < 0.001$ for three models and $p < 0.01$ for one model.