



Figure 9 Recognition confusion for providing matching feedback across all exercises and validation study participants (healthy adults). Numbers in cells show class-relative accuracy (first line) and number of instances (second line).

3.6.2 Evaluation with COPD patient in intervention study

We evaluated system performance for counting exercise repetitions and recognizing the trainee errors performed in a group of seven COPD patients. During the intervention study recordings, we observed that the therapist could not accurately assess all exercise repetitions, because it was difficult to observe the patient's movements and annotate the exercise performances simultaneously. A ground truth labelling was derived in a post-recording step according to the raw sensor measurements, as explained in Section Evaluation with COPD patients. We needed to exclude two sessions of Step-ups performed by Patient 1, three sessions of Leg lifts, by Patient 3, and one session of Knee extensions by Patient 7, due to data recording issues. Patient 6 could only complete the first session of Elbow circles due to shoulder pain. In total, 1176 exercise repetitions were acquired and analysed.