Patients were defined as users of prophylaxis if they were prescribed aerosolized tobramycin with refills. Using the date of that first prescription to define the beginning of prophylaxis for each patient, data were collected for the year prior and the year following the beginning of prophylaxis. We used descriptive statistics to examine differences in number of inpatient admissions and length of stay (LOS) in comparison to a control group of patients with tracheostomy who did not receive prophylaxis.
Results: 47 (30%) patients in the study group used prophylactic tobramycin. There was a significant difference in the LOS in the tobramycin prophylaxis 47 (30%) patients in the study group used prophylactic tobramycin. There was a significant difference in the LOS in the tobramycin prophylaxis group one year after initiation of tobramycin prophylaxis (16.96 ± 48.79) compared to one year before (31.02 ± 56.83), (p value = 0.04) using the Wilcoxon signed rank sum test. The number of hospitalizations (2.62 ± 2.31 versus 2.15 ± 2.58) was decreased in the prophylaxis group, but not significantly so. For the control group patients without tobramycin prophylaxis, there was no significant change in LOS (7.07 ± 13.54 versus 7.80 ± 15.38) or inpatient admissions (1.36 ± 1.55 versus 1.59 ± 1.86), from 1 year to the next.
Conclusions/Significance: In this sample of children with tracheostomy and frequent pulmonary infections, aerosolized prophylaxis with tobramycin did not reduce hospital admissions, but did reduce LOS. Our tobramycin prophylactic group was more ill at baseline than the comparison group as evidenced by the longer LOS and increased number of hospitalizations. Our sample size was small, but we still saw a significant decrease in the LOS and the magnitude of that change was large (45%). Larger, randomized trials will be needed to assess the utility, cost effectiveness, and risk of prophylactic tobramycin in vulnerable patients.

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G1
Infant exploratory learning and leg joint coordination: influence of prematurity

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Background/Objectives: Preterm infants with very low birth weight (PT) are at risk for developing spastic cerebral palsy which is characterized by a reduced ability to selectively move the joints of the leg; e.g. flexing the hip while extending the knee. Research supports that full-term (FT) infants exhibit increased selective leg coordination when specific leg actions are reinforced using an overhead mobile. It is unknown whether PT infants at risk for cerebral palsy will exhibit more selective leg coordination. The purpose of this study is to determine the ability of PT infants to: (1) learn the contingency between leg action and mobile activation and (2) demonstrate increased selective leg coordination when specific leg actions are reinforced with a mobile.
Study Design: Prospective cohort.
Study Participants and Setting: Convenience sample of infants: 17 FT at 3 months, 11 PT at 3 and 4 months. Infants were excluded for crying during testing. Final sample: 14 FT, 6 PT at 3 months, 10 PT at 4 months. Setting: motion analysis lab.
Materials/Methods: Each infant participated in 2 sessions on consecutive days. Infants were positioned supine under a mobile. Day 1 consisted of a 2-min baseline condition in which the mobile did not activate in response to the infant's leg actions and a 6-min acquisition condition in which specific leg actions activated the mobile. Day 2 consisted of the same baseline and acquisition conditions plus a 2-min extinction condition in which the mobile could not be activated. Mixed regression methods were used to analyze the dependent variables of reinforced leg action (the leg actions reinforced by the mobile, a measure of contingency performance) and hip-knee correlation coefficient (a measure of selective leg coordination).
Results: FT infants increased reinforced leg action during the acquisition as compared to baseline condition to meet performance criteria Day 2 (adjusted $p < 0.05$). FT infants classified as Learners ($n = 5$), but not Non-Learners ($n = 9$), demonstrated decreased hip-knee correlation coefficients during acquisition on Day 2 as compared to baseline kicking on Day 1 (adjusted $p < 0.05$). PT infants at 3-months were not statistically analyzed due to small sample size, but 2 infants were classified as Learners, one decreased his hip-knee correlation coefficient, the other did not. PT infants at 4-months met performance criteria on Day 1 (adjusted $p < 0.05$). When comparing hip-knee correlation coefficients across conditions, there was not a statistically significant difference for PT infants at 4-months classified as Learners ($n = 6$) or Non-Learners ($n = 4$; adjusted $p > 0.05$).
Conclusions/Significance: PT infants at 3-months have difficulty regulating arousal levels during testing. PT infants at 4-months performed the task on Day 1, however unlike FT infants, PT infants who demonstrated learning did not exhibit more selective hip-knee coordination when interacting with the mobile. PT infants have difficulty generating selective hip-knee coordination and may require additional days participating in the paradigm to change their coordination pattern.

G2
Early intervention for autism with sensory treatment to alleviate tactile abnormalities reduces severity of autism: randomized controlled trial in 103 pre-school children with autism

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Background/Objectives: Tactile abnormalities are near-universally present in pre-school children with autism and have shown robust response to treatment with a daily parent-delivered massage protocol based on Chinese medicine (Qigong Sensory Treatment for autism). Two randomized controlled trials evaluating 5 months of the parent-delivered massage treatment reported that treatment also substantially reduced severity of autistic behavior and improved language in the home and classroom settings. Continued treatment resulted in additional improvement. Treatment is based on a model proposing tactile abnormalities and their associated delay of early self-regulation milestones contribute to severity of aut-

ism. The model is supported by data. This is the first report from a 2-year replication and extension study reporting outcomes from the first 5 months.
Study Design: Randomized controlled design: (single blinded). 103 pre-school children with autism were randomly assigned to treatment and control conditions. Treatment group received 5 months of the Qigong Sensory Treatment Dual massage intervention in which parents gave daily treatment and trained therapists gave weekly treatment and parent support. Evaluation was conducted by trained professionals who were blind to group and parents.
Study Participants and Setting: Participants were between the ages of 3 and 6 and receiving early intervention services for autism. Treatment was provided daily in the home by parents and weekly in the home or office by trained therapists. Ongoing parent support and training was provided by trained therapists in 20 weekly home or office visits.
Materials/Methods: Treatment was with a massage protocol based on Chinese medicine directed at tactile abnormalities. The protocol is called Qigong Sensory Treatment for autism and is formalized in a parent-training handbook. Parents received an initial 3-hour training, followed by ongoing training and support provided in 20 weekly visits with trained therapists. Pre and post-testing was done with validated measures including the Childhood Autism Rating Scale, the Autism Behavior Checklist, the Preschool Language Scale, the Sense and Self-Regulation Checklist and the Autism Parenting Stress Index.
Results: Five-month outcomes replicated earlier studies and showed decreased severity of autism (F 5.17(2,81) $p = 0.008$), decreased tactile, and other sensory symptoms (F15.16(1,82) $p < 0.000$), decreased self-regulatory difficulties/delays (F17.9 (1,82) $p < 0.000$), decreased autistic behavior (F8.11(1,82) $p = 0.006$), decreased parenting stress (F17.2(1,82) $p < 0.000$), and increased receptive language (F(1,82) $p = 0.03$). Treatment was effective in both low- and high-functioning children.
Conclusions/Significance: Results of this study replicate earlier studies and show decreased tactile abnormalities, improved self-regulatory abnormalities, decreased severity of autism overall, as well as improvement of behavior, communication and sensory symptoms. This program can be recommended to parents and early intervention programs and is suitable for implementation at the time of autism diagnosis. Results lend support to a model for autism proposing that tactile abnormalities and global delay of early self-regulation contribute to severity of autism. A full diagnostic evaluation of the sense of touch has not yet been carried out in autism. The authors urge that this be awarded priority on the national autism research agenda.

G3
Early vibration assisted physiotherapy in children with cerebral palsy (12–24mo of age) – pilot RCT

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Background/Objectives: Promising results regarding the improvement of strength (muscle and bone) have been reported for vibration assisted physiotherapy in a recent review on interventions for children with cerebral palsy (CP) (Novak et al. 2013). In several retrospective analyses of a functional interval-rehabilitation program combined with 6 months home-based vibration training (Stark et al. 2010, Stark et al. 2013, Hoyer-Kuhn et al. 2014, Stark et al. 2015) our group has shown similar positive results for the improvement of mobility. Evidence suggests that early intervention is more effective. In this pilot trial we aim to investigate the feasibility, safety and possible effectiveness of early vibration assisted physiotherapy on motor development in young children with CP between 12 and 24 months of age.
Study Design: Randomized controlled crossover trial.
Study Participants and Setting: 24 children with CP, GMFCS Level II—IV (mean age 19.0 ± 3.1mo, 11 girls, 13 boys) were recruited at the Children's University Hospital Cologne, Germany.
Materials/Methods: The intervention included 2 weeks of introduction and 12 weeks of vibration assisted physiotherapyt (total 14wks of training). The control intervention was 14 weeks of standard of care. The follow-up was 14 weeks for the intervention group. The control group started 14 weeks of training after the 14-week waiting-control-phase. The training device was a side-alternating neuromuscular stimulation system with a tilt table. Frequencies: 5–27 Hz, Amplitude 0–2.5 mm. Primary efficacy endpoint was the change of gross motor function (GMFM-66) from week 1 (T0) to week 14 (T1). Secondary endpoints were the domains "mobility" and "self-care", measured by the PEDI. Safety parameters were recorded according to official guidelines.
Results: Four children improved their GMFCS-Level in the training-group and 2 in the control group. Both groups improved their mobility in the GMFM-66; the control group slightly better (difference T0-T1: control = 3.3 points, training ITT = 2.4 points). The training group developed better in the PEDI domains: the difference between groups was 4.9 points for "mobility" ($p = 0.15$) and 1.8 points for "self-care" ($p = 0.21$). None of the changes was significant. Safety parameters were equal in both groups. No drop-outs were recorded and the training compliance and motivation of the participating families was very high.
Conclusions/Significance: The early vibration assisted therapy in children with CP has been feasible and safe. The PEDI domains developed better in the intervention-group. After the short training period (14wks) the vibration assisted therapy had no significant effect on the mobility between groups. It can be discussed whether this was due to the very standardized treatment protocol compared to the individualized, functional therapy in our previous work, the small sample or the short training period. The compliance of the patients and their families was very high.