Central States Chapter (#1)

Monitoring External Training Loads and Neuromuscular Performance for Division I Basketball Players over the Pre-Season

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External training load (TLE) is used to quantify the biomechanical load accrued during training. The countermovement (CMJ) jump is used to evaluate neuromuscular fatigue and recovery in response to TLE. However, limited research has coupled TLE parameters with changes in neuromuscular performance variables from the CMJ. **Purpose:** The purpose of this investigation was twofold: 1) to characterize TLE across the pre-season and 2) examine the differences in TLE per session and CMJ performance across the 5 weeks of preseason training in NCAA D1 basketball athletes. Additional analyses examined the influence of position and scholarship standings. **Methods:** TLE was monitored in 14 male athletes during 22 basketball practice sessions over the course of the preseason. In addition, weekly CMJs were used as an indicator of neuromuscular fatigue and performance. A 3-way (2 X 2 X 5) Repeated Measures Analysis of Variance with Bonferroni post hoc analysis was used to examine differences in the average TLE per session each week and differences in the CMJ variables of Flight Time:Contraction Time (FT:CT) and Jump Height (JH) across time and between position (Guard vs. Forward/Center) and academics (Scholarship vs. Walk-on). Statistical significance was set at p ≤ 0.05) **Results:** Player load per minute (PL; PL/min) was significantly higher during Week 1 and Week 2 compared to Week 3 (p < 0.05). No significant differences were observed for average PL, high inertial movement analysis (IMA), or Total Jumps per session across the 5 weeks of pre-season (p > 0.05). A significant group X time interaction indicated Scholarship athletes had greater PL, PL/min, 2 Dimensional PL, High IMA, and Total Jumps compared to the Walk-on athletes. Player position did not influence TLE. No significant differences were observed in FT:CT or JH over the 5 weeks of preseason (p > 0.05) or between groups (p > 0.05). **Conclusion:** The present study characterizes the TLE demands in collegiate basketball during the pre-season. The average TLE per week did not vary across 5 weeks of training, while differences in intensity (PL/min) were evident. While no differences were observed between position groups, there was a significant difference in TLE between scholarship and walk-on athletes.

Are Mental Toughness and Self Compassion Contradictory Concepts?

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Based on National Collegiate Athletic Association (NCAA) reports, there is high prevalence of *mental health* (MH) issues in student-athletes. Preliminary data have shown a positive relationship between *mental toughness* (MT) and MH as well as *self-compassion* (SC) and MH. However, the theoretical backgrounds of the conceptualizations of MT and SC appear contradictory. **Purpose:** To confirm the two aforementioned relationships and investigate the relationship between MT and SC in a NCAA Division III environment. Hypotheses: (a) MT and SC will have a positive relationship with MH and (b) MT and SC will have a negative relationship. **Methods:** The MTI, SCS, and MHC-SF questionnaires were uploaded on Qualtrics. All SUNY Plattsburgh athletes were invited to participate via email. The sample (n=222, response rate: 63%) was predominantly White, freshmen, soccer/lacrosse/track athletes in pre-/in-season with a similar representation of gender (M_{age}=19.1,SD=1.2). The analysis consisted of Pearson correlations in IBM SPSS Statistics. **Results:** The results showed a positive relationship between MT and MH (r=0.417, p<0.0005) and SC and MH (r=0.542, p<0.0005). The first hypothesis was accepted. Concerning the subscales of MH (i.e., psychological, social, and emotional wellbeing), both MT and SC had the strongest relationships with psychological wellbeing (r=0.46, p<0.0005; r=0.551, p<0.0005, respectively). Findings also indicated a positive relationship between MT and SC (r=0.433, p<0.0005). The second hypothesis was rejected. The strongest relationship between MT and the subscales of SC was with self-kindness (SK) (r=0.383, p<0.0005); for SC and MT subscales, it was attention regulation (AR) (r=0.464, p<0.0005). **Conclusion:** MT and SC complement, rather than contradict, one another in support of student-athletes' MH. Two of the strongest links comprising this complementarity are AR and SK. While the former is unsurprising, the positive link between kindness and toughness is provocative. Coupling fierce determination with kind acceptance of struggle may be counterintuitive, but its implications for MH are too important to overlook. Teaching student-athletes to hold these competing qualities may strengthen current NCAA MH treatment initiatives. Future studies should further investigate DIII schools as well as the moderation effect of MT on SC and MH.

Static Cerebral Autoregulation is Not Altered in Symptomatic Concussed Athletes during Acute Central Hypervolemia

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Dynamic cerebral autoregulation is impaired in concussed individuals. However, less is known regarding static cerebral autoregulation in symptomatic concussed athletes during a central hypervolemic challenge that increases blood pressure. **Purpose:** We tested the hypothesis that static cerebral autoregulation during a central hypervolemic challenge is impaired in symptomatic concussed college athletes (CA) vs healthy controls (HC). **Methods:** Seven CA (age: 19±2 y, 5 females) and ten HC (age: 21±2 y, 6 females) completed one study visit. After 5 min of resting baseline, 20 mmHg of lower body positive pressure (LBPP) was applied for 5 min using an airtight chamber. Beat to beat blood pressure (photoplethysmography) and middle cerebral artery blood velocity (MCAv; transcranial Doppler) were recorded continuously. Static cerebral autoregulation was calculated using Fourier transfer function analysis with 3 min segments at baseline and after mean arterial pressure (MAP) stabilized during LBPP. Cerebral vascular resistance (CVR) was calculated as MAP/MCAv. Pulsatility index (PI) was calculated as the difference of peak systolic MCAv and end diastolic MCAv, divided by mean MCAv. Values are reported as a change from baseline. **Results**: MAP (CA: 90±6 vs HC: 92±11 mmHg; P=0.32), MCAv (CA: 58.7±19.4 vs HC: 62.6±11.1 cm/s; P=0.30), gain (CA: 0.7±0.2 vs HC: 0.8±0.2 cm/s/mmHg; P=0.17), coherence (CA: 0.5±0.1 vs HC: 0.5±0.1; P=0.21), CVR (CA: 1.7±0.6 vs HC: 1.5±0.3 mmHg/cm/s; P=0.21), and PI (CA: 0.9±0.1 vs HC: 0.9±0.2; P=0.31) were not different at baseline. The change in MAP was not different between CA (12±6 mmHg) and HC (8±6 mmHg; P=0.12). The change in MCAv was greater in CA (CA: 4.8±4.6 vs HC: -4.3±8.7 cm/s; P=0.01). There were no differences in the change from baseline for gain (CA: 0.1±0.2 vs HC: 0.1±0.5 cm/s/mmHg; P=0.49) or coherence (CA: -0.0±0.1 vs HC: -0.0±0.1; P=0.40). The increase in CVR was attenuated in CA (CA: 0.0±0.2 vs HC: 0.3±0.3 mmHg/cm/s; P=0.04). The decrease in PI was greater in CA (CA: -0.1±0.0 vs HC: 0.0±0.1; P=0.02). **Conclusion:** These data indicate that indices of static cerebral autoregulation are not different between CA and HC during an acute increase in MAP. The blunted increase in CVR and greater decrease in PI appears to allow for a rise in MCAv during an acute increase in MAP in CA.

A Pilot Nutrition Education Intervention with Division I Women's Basketball Players

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Appropriate nutrition is important for both health and optimization of sport performance; however, many athletes do not have sufficient nutrition knowledge to engage in ideal nutrition practices. Few studies have been conducted to investigate the efficacy of a nutrition education intervention on athletes' nutrition knowledge, and even fewer have done so using a validated assessment tool. **Purpose:** To evaluate changes in nutrition knowledge of NCAA Division I women's basketball players after a sport-focused nutrition education intervention using a validated nutrition knowledge survey. **Methods:** NCAA Division I women basketball players (N=8) completed a validated nutrition knowledge survey (Calella et al., 2017) that evaluated both general and sport nutrition. Athletes then participated in six, once weekly, 20-minute nutrition education sessions led by a Registered Dietitian. Topics included: hydration, carbohydrates, protein, fats, meal planning, and micronutrients/supplements. At the end of six weeks, the survey was re-administered. Scores were summed as +1 for a correct answer and +0 for no answer, an incorrect answer, a double-answer, or the "I don't know" option. Maximum possible score was 97. A paired-samples t-test was conducted to evaluate baseline versus follow-up scores. **Results:** At baseline, athletes scored 40.5±18.0 out of 97 possible, 27.0±12.7 out of 64 possible, and 13.9±6.2 out of 33 possible for the total survey, general nutrition and sport nutrition sections, respectively. Significant average score increases were found for the total survey overall (62.2±11.7, p=0.004), within the general nutrition section (40.4±7.7, p=0.015), and within the sport nutrition section (21.9±5.9, p<0.001). **Conclusion:** The education intervention used in this pilot study succeeded in increasing nutrition knowledge of Division I women's basketball players. Future research should include intake assessments to determine whether eating habits improve after nutrition education.

Efficacy of a Recess-Based Intervention on Academic and Health Outcomes in Elementary School Children

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Both cardiorespiratory and muscular fitness are important for overall health and may benefit academic related outcomes in children. However, few intervention studies have examined the impact of an intervention that has emphasized both components on academic or cognitive outcomes. Furthermore, school recess may be an ideal time to promote physical activity and fitness and has been a relatively understudied setting in relation to these outcomes. **Purpose:** To evaluate the preliminary efficacy of a 3-month recess-based combined fitness intervention (INT; consisting of both aerobic and muscular fitness activities) on cognition (inhibition and working memory), classroom behaviors (engaged and off-task behaviors), fitness (cardiorespiratory and muscular), and moderate to vigorous physical activity (MVPA) in elementary school-age children. **Methods:** Schools (n=2) were randomized to either the INT (n=27, sex: 66.7% male, age: 8.8±0.1 years) or control group (CON; n=27, sex: 42.3% male, age; 9.4±0.1 years). Baseline and post-intervention measures included a flanker test (inhibition), list sorting test (working memory), classroom behavior observation (on- and off-task behaviors), 20-meter shuttle run (cardiorespiratory fitness), muscular fitness battery (muscular fitness), and accelerometry (MVPA). Process evaluation measures were recorded daily, weekly, and post-intervention. ANCOVA models were adjusted for baseline score, age, and other covariates. An independent samples t-test was used to compare percent of time spent in MVPA during recess between schools. **Results:** Percent of time spent in MVPA during recess was significantly higher in the INT compared to the CON group (INT=41.7±2.1%; CON=30.4±0.2, p<0.001). No other significant differences were observed. Although participant enjoyment and INT acceptability was high, the average participation in INT sessions was 19.4% (ranging from 0 to 95.6%). **Conclusion:** This pilot study demonstrated some preliminary support that offering a combined fitness program is feasible and can increase percent of time spent in MVPA during recess. Future research is warranted to determine if the INT can impact academic or cognitive outcomes.

The Relationship between Parent Perceptions of Physical Activity Environment and GIS Measures in Rural Communities

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Rural youth are at heightened risk for obesity compared to urban youth. This phenomenon may be partly attributable to a lack of access to safe physical activity (PA) spaces within rural neighborhoods such as lengthy distances to parks/school playgrounds or a lack of walking/bicycle trails. Parental perceptions of PA environment may meaningfully influence children's PA behavior, and subsequently, weight status. However, few studies have examined associations between quantitative measures of rural PA environment (Geographic Information Systems; GIS), parent perceptions of PA environment, and child standardized Body Mass Index (BMI z-scores). **Purpose:** To examine the relationship between parental PA environment assessment (i.e., 1-4 survey scale indicated poor to favorable PA accessibility/safety), GIS environmental data, and child BMI-z scores in a rural community. **Methods:** Baseline data from the NU-HOME study, a randomized trial to prevent childhood obesity in rural youth ages 7-10 years old were analyzed. Anthropometrics and surveys were collected prior to randomization to immediate- or delayed-intervention; the trial enrolled 114 families. For the current study, a subset (n=90) of child-parent dyads was included in a cross-sectional analysis, based upon geographic location. Families who did not live within two specific intervention-delivery towns were excluded from the sub-analysis. ArcGIS software was utilized to attain measures of PA environment: 1) proximity to parks and schools with playgrounds (ArcGIS tool: near), and 2) street connectivity (ArcGIS tool: quarter- and half-mile buffers; variable represents active transport accessibility for walking/biking). Associations were examined with Spearman correlations. **Results:** Measures of PA environment did not significantly differ across the two rural towns; therefore, subsequent analysis were not stratified by town. Parent perceptions of safe access to walking/biking were associated with GIS measures; closer proximity measures resulted in favorable parental PA perceptions. Perceptions of neighborhood PA levels were moderately correlated to school playground proximity (r=-0.379; p<0.001); endorsements of biking trail access were associated with park nearness (r=-.261; p=0.020). A positive relationship between PA environment perceptions and street connectivity was observed (r=0.260; p=0.021). Neither parent perceptions or GIS measures of PA environment were correlated with child BMI z-scores. **Conclusion:** In the selected rural communities, data indicate significant and meaningful correspondence between parent perceptions of PA environment and quantitative GIS measures. Findings suggest barriers to children's PA in rural communities may be environmental in nature. Future community health programming for rural families should focus upon offering PA interventions which can be adapted to the home environment, if access to PA in the surrounding neighborhood is infeasible.

Thermoregulatory and Cardiovascular Response to Acute Passive Heat Exposure in Low-Level Spinal Cord Injury

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Spinal cord injury (SCI), which impacts both the afferent and efferent pathways of the thermoregulatory system and impairs sympathetically mediated blood flow redistribution, may compromise the thermoregulatory and cardiovascular response to heat stress. However, because the magnitude of these impairments is related to the level of injury, heat stress may be well tolerated in individuals with low-level SCI. **Purpose:** To compare the thermoregulatory and cardiovascular adjustments to acute passive heat exposure (APHE) in individuals with low-level SCI and able-bodied (AB) individuals. **Methods:** Four individuals (1F) with low-level SCI (T8-T11) and 21 AB individuals (11F) completed a one-hour APHE session in 40°C water. Skin red blood cell (RBC) flux, rectal temperature (T_{re}), cardiac output ($\dot{Q}_c$) (open circuit acetylene uptake), and brachial mean arterial pressure (MAP) were measured during baseline rest and throughout APHE. RBC flux, measured at two sites on the ventral forearm (laser Doppler flowmetry), was divided by MAP to calculate cutaneous vascular conductance (CVC). Local heating to 44°C was performed following APHE, and data are presented as a percentage of maximal CVC (% CVCmax). Data are reported as mean ± SEM. Statistical analyses were conducted via unpaired, two-tailed t-tests. **Results:** CVC was similar between groups at baseline (SCI: 11 ± 6% CVCmax and AB: 8 ± 1% CVCmax, P = 0.282) and was similarly increased by 60 min APHE (SCI: 48 ± 4% CVCmax and AB: 46 ± 3% CVCmax, P = 0.701). T_{re} was similar between groups at baseline (SCI: 37.0 ± 0.3°C and AB: 37.3 ± 0.1°C, P = 0.052) and after 60 min APHE (SCI: 38.5 ± 0.2°C and AB: 38.6 ± 0.04°C, P = 0.361). $\dot{Q}_c$ was similar between groups at baseline (SCI: 5.9 ± 0.4 L·min^{-1} and AB: 5.3 ± 0.2 L·min^{-1}, P = 0.173) and was similarly increased by 60 min APHE (SCI: 8.7 ± 0.9 L·min^{-1} and AB: 9.8 ± 0.5 L·min^{-1}, P = 0.286). MAP was similar between groups at baseline (SCI: 85 ± 3 mmHg and AB: 86 ± 1 mmHg, P = 0.670) and was similarly reduced throughout heating (SCI: 74 ± 3 mmHg and AB: 78 ± 2 mmHg by 60 min APHE, P = 0.319). **Conclusion:** Individuals with SCI and AB individuals initiate similar increases in skin blood flow above the lesion level and cardiac output in response to hot water immersion, allowing both groups to maintain T_{re} and MAP within safe ranges.

Rocky Mountain Chapter (#8)

Longitudinal Associations of Physical Activity with Motivation and Physical Activity Planning among Emerging Adults

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Purpose: Physical activity (PA) negatively correlates with the risk for obesity-related chronic diseases. Only 25% of adolescents engage in the recommended amount of PA, indicating the need for a better understanding of behavioral determinants, such as motivation and planning. **Methods:** This study used data from the NEXT Generation Healthy Study (NEXT), a nationally representative study of adolescents, to examine longitudinal relations of PA participation among emerging adults with intrinsic motivation, extrinsic motivation, and PA planning. The NEXT study administered surveys in yearly waves, beginning in the 10th grade. This study used data from Waves 2 (W2) (11th grade) through 7 (W7) (4 years post-high school). Growth models examined the longitudinal effects of time-invariant (sex, race, affluence, and BMI) and time-varying (intrinsic and extrinsic motivation and PA planning) covariates on PA participation using a piece-wise approach to account for the U-shaped longitudinal trajectory of PA participation. Model fit was tested using log likelihood difference tests, RMSEA, and BIC, and accounted for complex survey features. **Results:** The final two-piece model indicated: 1) PA declined from W2 – W4 (b=-0.37, p<.05) and increased from W4 – W7 (b=-0.04, p=.19); 2) At W2, females (b=-0.83, p<.05) and Blacks (b=-0.48, p<.05) demonstrated significantly lower PA compared to males and Whites, respectively; and 3) From W4 – W7, participants with low (b=-0.19, p<.05) or high (b=-0.22, p<.05) affluence demonstrated significantly smaller increases in PA compared to those with moderate affluence. Increased intrinsic motivation significantly predicted increased PA across all waves (b: 0.09-0.36, p<.05). Increased extrinsic motivation significantly predicted increased PA at W6 (b=0.13, p<.05) and W7 (b=0.22, p<.05) only. PA planning significantly predicted PA (b=0.40, p<.05) and varied between individuals. Our findings indicate the transition from adolescence into adulthood is characterized by a transient increase in PA participation, suggesting this may be an ideal timeframe for addressing PA participation. Intrinsic motivation and PA planning had a greater association with longitudinal PA participation than extrinsic motivation, suggesting that these may be useful to prioritize as intervention targets during this adolescence-into-adulthood transition.

Southeast Chapter (#9)

Association between Sedentary Time and Physical Activity with Glucose Concentrations and Glycemic Variability

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Increased time spent being sedentary and decreased physical activity (PA) of all intensities have been linked to decrements in metabolic health, such as glucose metabolism. Glycemic variability has increasingly been recognized as a marker of glucose metabolism. **Purpose:** To evaluate the association between objectively measured sedentary time and PA with fasting and 2-hour oral glucose tolerance test (OGTT) glucose concentrations, and glycemic variability assessed by continuous glucose monitoring (CGM) in sedentary adults. **Methods:** Middle-aged adults (n=28; 46.0±6.1 years; BMI 32.3±6.2 kg/m^2) completed a 7-day period of accelerometer and CGM monitoring, as well as performed an OGTT. Accelerometry assessed sedentary time (<1.5 METs excluding sleep time) and time spent performing light- (1.5 to <3.0 METs), moderate- (3.0 to <6.0 METs), and vigorous-intensity (≥6.0 METs) PA was measured utilizing a Sensewear Mini Armband. Following a 12-hour fast, serum glucose concentrations were measured at fasting and 30-, 60-, 90-, and 120-minute after consuming a 75-gram glucose drink. CGM was used to calculate 24-hour glycemic variability using standard deviation, glycemic variability coefficient of variation, and the j-index [calculated as 0.001×(mean glucose concentration+standard deviation of mean glucose concentration)^2]. For both the accelerometer and CGM, data were considered valid with a minimum wear time of 20 hours and for 5 days including 1 weekend day. **Results:** No glucose concentrations were found to be significantly associated with sedentary time or PA measures. Interestingly, light-intensity PA, combined time performing moderate- and vigorous-intensity PA (≥3.0 METs), and total PA (≥1.5 METs) were all found to be negatively associated with the j-index (r=-0.404, p=0.041; r=-.389, p=0.049; r=-0.435, p=0.026, respectively). However, after adjustment for BMI, these associations were no longer significant (p>0.505 for all). **Conclusion:** These results suggest that PA of varying intensities could potentially impact glycemic variability but may be influenced by BMI. Future studies should evaluate more sensitive measures of glycemic variability to further assess its association with sedentary time and PA of all intensities.

Southwest Chapter (#10)

The Genetic Expression of Individuals with Traumatic Spinal Cord Injury Following an 8- Week Group Exercise Program

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A traumatic spinal cord injury (SCI) is a devastating event with lifelong consequences. Infections, cardiopulmonary and metabolic disorders are plaguing the quality of life of those with SCI. Exercise may delay the onset of comorbidities and has been shown to improve the health of those with SCI. However, the underlying mechanism are unknown. **Purpose:** Our goal was i) to compare SCI to control and ii) to identify the pathways underlying the effect of exercise in SCI. **Methods:** _Subjects:_ Blood draws were performed before and after 8-week group exercise training for 11 people with SCI. RNA was extracted, amplified and sequenced via next-generation sequencing (Illumina). _Protocol_: Subjects engaged in exercise 2x/wk for 1h. Aerobic exercise (AE) consisted of a 30-mins wheel-chair-based exercise at 55-80% HR_{max},. Resistance exercises consisted of 6 movements, 8-10 reps for 3 rounds using elastic bands. **Results:** _Spinal Cord Injury_: A clear gene expression pattern appeared on the heat map when we compared SCI and control. Network analysis revealed more than 150 canonical pathways significantly different from control. The greatest change was observed for the interferon signaling (p=(-log(2.11)). Analysis of genes associated with function and diseases yield 500 genes with significant changes. Cell signaling (p<0.0001) displayed the greatest change and the upstream regulators of MAPK1, an important pathway involved in the immune system, appear to be downregulated following injury. _Training:_ A heat map shows that the overall impact of exercise is important for the SCI group with more than 200 canonical pathways revealed including nervous, circulatory and immune systems. Functional and disease analysis yields the most change to cancer, gastrointestinal disease, organismal injury and abnormalities (p<0.05). **Conclusion:** Our data revealed for the first time the transcriptome-wide expression pattern of individuals with SCI and of an 8-weeks exercise program.

Silicon Ions Enhance Myogenic Differentiation in C2C12 Skeletal Muscle Cells

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The regeneration of bone and muscle tissue following musculoskeletal injuries is essential in sports medicine in order to restore function and prevent chronic musculoskeletal disorders related to physical inactivity. According to data collected by the American Academy of Orthopaedic Surgeons from 2012 to 2014, 8.3% (approximately 2.6 million people) of the adult population in the United States received treatment for musculoskeletal injuries, costing an aggregate total of $213 billion dollars. Recent regenerative musculoskeletal research suggests that the restoration of function and structure for normal physical activity is dependent on the synergy of regeneration processes found in bone and muscle tissue. Current treatments for severe musculoskeletal defects lack biocompatibility and rarely restore full function, so focus has shifted to regenerative biomaterials. Recent evidence indicates that bioactive gels and implants incorporating silicon (e.g. silicon ion, orthosilicate acid, amorphous silica) markedly increased osteogenesis *in vitro*, but little research has been conducted over the effect of these biomaterials on myogenesis. Establishing the existence of myogenic properties in silicon could lead to the development of a biomaterial that enhances the synergistic capacities of bone and muscle regeneration. **Purpose:** The purpose of this study was to investigate the effect of silicon ions on C2C12 skeletal muscle cells *in vitro*, in order to determine the regenerative viability of musculoskeletal gels and implants incorporating silicon. **Methods:** In order to evaluate the effect of Silicon ions on myogenesis, *in vitro* cell culture studies were performed using C2C12 mouse myoblast cell lines. Cells were differentiated for four and seven days in media containing three different concentrations of silicon ions (0.1, 0.5, and 1.0 mM) and a silicon free control. Samples were immunohistochemically stained and imaged using a Zeiss fluorescent microscope. Cellsens software was used to determine total nuclei count and ImageJ was used to count the number of fused nuclei within myotubules. Rates of myogenic differentiation were determined based on fusion index, the percent of nuclei found within myotubes relative to the total nuclei. **Results:** After four days there was a significant increase in fusion index ($p<0.001$) in the 0.1mM group (41±3.4) compared to the control (31±4.2) . After seven days all three silicon groups exhibited significantly higher fusion indices (0.1mM 60±3.2, $p<0.001$; 0.5mM 57.8±2.9, $p<0.01$; 1.0mM 54.8±3.6 $p<0.05$) compared to the control (50±2.4). Both four and seven day studies confirmed that the 0.1 Mm group had a markedly higher fusion index, indicating the highest rate of myogenic differentiation. **Conclusion:** Based on these results it can be concluded that silicon ions enhance myogenic differentiation. The myogenic potential of silicon ions exhibited by these results, combined with previously reported osteogenic effects, prompt further investigation into the potential of silicon-containing biomaterials to accelerate musculoskeletal regeneration, and decrease the risk of acute and chronic complications of injury.