**Mulligan techniques for neck pain**

The reason behind this study was to observe the effect of Mulligan mobilization technique on pain, functional level, kinesiophobia, depression, range of motion and quality of life in the older adults with neck pain. This technology was profermed by the specialist. The method for this technique was, that they have selected Forty-two older adults with pain of neck for this research, and they were selectively divided into two groups, the traditional physiotherapy group and traditional physiotherapy-Mulligan mobilization group. Ten sessions were programmed for this research study. The candidates were examine in terms of pain, range of motion, functional level, kinesiophobia, depression, and quality of life and both pre and post treatment.Pain, functional level, kinesiophobia, range of motion, depression, and quality of life was the aim to improved in both groups by following treatment. while comparing effects of these two treatment programs, it was observed that the traditional physiotherapy-Mulligan mobilization group had a better outcome result in terms of range of motion, kinesiophobia, depression, and quality of life. After that all it was concluded that traditional physiotherapy-Mulligan mobilization in older adults with pain of neck has been found to have effective on pain, range of motion, functional level, kinesiophobia, depression, and qualityof life as.

The mechanical neck pain rises from the posteior side of the skull which travels towards the lower cervical spine and shoulders which is very uncomfortable. In this discomfort, vertebral arrangements are also  misbalanced and the cervical spine joints and ribs fails to perform the proper biomechanical movements resulting in
decreased range of motion, which creates motionlessness and pain. In this study, Mulligan sustained natural apophyseal glides (SNAGS) and natural apophyseal glides (NAGS) were applied in mechanical neck pain pateints to reduce the pain and motionlessness. A clinical trial with simple random sampling by random number table was conducted selectively. A sample size of 50 (n=50) pateints were taken from physiotherapy department National Hospital Lahore, and they have done the selection criteria and were distributed into two equal groups of twentyfive each. The treatment protocol remained same for both the groups, which was neck strengthening exercises, range of motion, and short wave diathermy. Group A received Mulligan SNAGS and on the other hand group B received NAGS. Treatment frequency was three times per week for two weeks. pateints were examine at the start of the programe and at the completion of second week. Each data were collected using Numeric pain rating scale to observe change in pain intensity and demographic data by constructed questionnaire. The data were analyzed by using SPSS version 22.
 The calculated mean value of pain on NPRS and standard deviation for both groups A & B before treatment was 3.72 ± 0.61373 and 3.84 ± 0.47258 respectively, while after six sessions the included and then calculated mean ratio of the pain on NPRS and standard deviation for group A and B was 1.28 ± 0.45826 and 1.92 ± 0.81240 individually. The calculated “t” value was -3.431 and “p” value 0.001, which was an illustration of statistically significant difference between the mean values of NPRS pre and post treatment in terms of pain relief.The study concluded that Mulligan sustained natural apophyseal glides (SNAGS) are more effective than natural apophyseal glides (NAGS) in pateints with mechanical pain of neck.

 As the pain of neck is common in nursing professionals is much higher than in the general population. However the, concrete proof is not available regarding to the intended result of the therapeutic intervention for treating pain of neck among them. The purpose of this programme was to compare the efficacy of Mulligan's self-sustained natural apophyseal glides (SNAGs) and conventional physiotherapy in the management of work-related neck pain among the NPs.  A total of 38 nursing profssionls with WRNP were enlisted by using the simple random sampling to participate in this two groups also were pretest–posttest and single-blinded randomized controlled study from recognized tertiary care teaching hospital. Enlisted NPs were randomly allocated into two groups such as Group A and Group B. Neck in Group A taught self-SNAGs with a towel and instructed to perform 10 repetitions ×1 set/two hour ×4 times/day for 5 days/week ×2 weeks. Whereas in Group B, NPs received conventional physiotherapy treatment, consist of neck static contraction, and performed for 10 s ×10 repetitions ×1 set/day ×5 days/week ×2 weeks. Both groups were asked to use the hot packs for 15 min, before their intervention. Visual Analog Scale (VAS) score, the neck disability index, and cervical range of motion were documented at baseline, 2nd-week post intervention, and 4th-week follow-up period and analyzed. Group A revealed statistical significance difference (*P* < 0.05) in VAS, NDI, and neck range og motion when compared to Group B. Mulligan's self-SNAGs have proved to be more beneficial over the conventional physiotherapy in the management of WRNP in between the nursing professionals.

* <http://www.amhsjournal.org/article.asp?issn=2321-4848;year=2018;volume=6;issue=1;spage=48;epage=53;aulast=Aggarwal>
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**Mulligan techniques for pain of shoulder**

The frozen shoulder, also known as adhesive capsulitis, is very painful condition in which the movement of the shoulder is ristricted and large mobility disabilities.The socio-economic burden will increase as with continuous aging of the population. In addition, both commonness and incidence figures of adhesive capsulitis are rapidly increasing. No written works overview not involving anyone or anything else focuses on the physiotherapeutic views in patients with frozen shoulder and their scientific proves. Moreover, although some physiotherapeutic interventions show facts regarding reduce motionlessness, there is little evidence to suggest that the disease course is affected and this raises the need for new, innovative research in the area of adhesive capsulitis and its treatment. By presenting its current evidence, they hope to bring several gaps in the present management of adhesive capsulitis by physiotherapists and provide new insights for improving the physiotherapists' policies in treating adhesive capsulitis patients, continuously increasing nociceptive impulse activity, as in early stages of frozen shoulder, could lead to peripheral and subsequently long-lasting central sensitization, as well as to an increased activity of the sympathetic nervous system. But up to now the involvement of central sensitization in adhesive capsulitis has not been studied yet and remains in order. Finally, when selecting a physical treatment method for adhesive capsulitis, it is extremely important to consider the patient's conditions, stage of the condition, and recognition of different patterns of motion loss. Guidelines for clinical assessment will be presented in this scoping review.

Previous research suggests that Mulligan's Mobilisation-with-Movement technique for the shoulder produces rapidly improvement in pain and range of motion. The aims of this study were to investigate the time course of the effects of a single MWM technique and to ascertain the effects of adding tape following MWM in people with shoulder pain. Twenty-five participants (15 males, 10 females), who responded positively to an initial application of MWM, were randomly assigned to MWM or MWM-with-Tape. Range of movement (ROM), pressure pain threshold (PPT) and current pain severity were measured pre- and post-intervention, 30-min, 24-h and one week follow-up. Following a one-week washout period, participants were crossed over to receive a single session of the opposite intervention with follow-up measures repeated. ROM significantly improved with MWM-with-Tape and was sustained over one week follow-up (p < 0.001; 18.8°, 95% confidence intervals (CI) 7.3–30.4), and in PVAS up to 30-min follow-up (38.4 mm, 95% CI 20.6–56.1 mm). MWM demonstrated an improvement in ROM (11.8°, 95% CI 1.9–21.7) and PVAS (40.4 mm, 95% CI 27.8–53.0 mm), but only up to 30-min follow-up. There was no significant improvement in PPT for either intervention at any time point. MWM-with-Tape significantly improved ROM over the one-week follow-up compared to MWM alone (15.9°, 95% CI 7.4–24.4). Both MWM and MWM-with-Tape provide a short-lasting improvement in pain and ROM, and MWM-with-Tape also provides a sustained improvement in ROM to one-week follow-up, which is superior to MWM alone.

Through nociceptors and mechanoreceptors joints may have an effect on the function of the surrounding the muscles. Pain reduction in the shoulder might lead to improved function of the muscles surrounding the shoulder in individuals with shoulder pain. The aim of our work was to determine the acute effect of Mulligan’s posterolateral glide on shoulder rotator strength, scapular motor control, and pain in painful shoulders.Individuals with shoulder pain were randomly assigned to a control active exercise group /and an experimental Mulligan’s posterolateral glide group. VAS, scapular upward rotation and shoulder rotator strength were the outcomes measured before and after three sessions of intervention. Multivariate analysis of variance (MANOVA) was used to analyze the differences between the groups after the intervention. A total of 31 subjects with shoulder pain participated in the study. After the intervention, VAS scores (FF (1, 29) == 27, p<0.01p<0.01) and Shoulder external rotator strength (FF (1, 29) == 4.6, p=0.04p=0.04) were statistically significantly different between both the groups as revealed by one-way MANOVA. There were no significant differences found between the groups in scapular upward rotation (FF (1, 29) == 0.09, p=0.7p=0.7) and internal rotator strength (FF (1, 29) == 0.03, p=0.8p=0.8) post treatment. Pain scores were lesser and the external rotation strength was higher after Mulligans’ mobilization when compared to active exercise.  Mulligan’s mobilization with posterolateral glide was effective in reducing pain and improving external rotator strength in individuals with painful shoulders when compare to active exercise. There were no significant differences noted in shoulder internal rotator strength and scapular upward rotation.

* <https://www.worldscientific.com/doi/abs/10.1142/S0218957716500147>
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**Mulligan techniques for cervical pain**

The sustained natural apophyseal glide (SNAG) is a mobilization technique commonly used in the treatment of painful movement restrictions of the cervical spine. In the manual therapy literature, the biological basis and empirical efficacy of cervical SNAGs have received scant attention. In particular, an examination of their potential biological basis in order to stimulate informed discussion seems overdue. This paper discusses the likely biomechanical effects of both the accessory and physiological movement components of a unilateral cervical SNAG applied ipsilateral to the side of pain when treating painfully restricted cervical rotation. The use of flexion and extension SNAGS, and rotation SNAGS performed contralateral to the side of pain are not considered. Although a cervical SNAG may clinically be able to resolve painfully restricted cervical spine movement, it is difficult to explain biomechanically why a technique which first distracts (opens) and then compresses (closes) the zygapophyseal joint ipsilateral to the side of pain, and perhaps slightly distracts the uncovertebral cleft, would be superior to a technique which distracts the articular surfaces with both accessory and physiological movement components. Therefore, the reported clinical efficacy of cervical SNAGs cannot be explained purely on the basis of the resultant biomechanical effects in the cervical spine.

The aim of the study is to evaluate the effects of NAGs on pain at available end range in cervical spine pain and stiffness. Method: Ethical approval was taken from Guru Nanak Dev University. It is a repeated measure design, with double blind controlled trials. VAS score in available end rage and the range of motion were the dependent measures. 100 patients, attending OPD, suffering from mechanical neck pain, meeting the predefined criteria were included in the sample. The sampling was incidental; subjects were randomly assigned to 3 experimental and 1 control group. All groups received hot packs for 12 minutes along with set of active exercises from day 1 to day 12. In experimental group 1, 2, and 3, NAGs as mobilisation technique was added at different points of study. All patients were assessed before and after the treatment on day 1, 2, 6, 7, 12 and 42 as follow up. Simple analysis of covariance (ANCOVA) with post-hoc ttest with adjusted means and graphical presentations. A significant improvement in ROM and decrease in pain at available end ranges was noticed in all experimental groups immediately after NAGs and was maintained on 42nd Day. Group 1 showed better recovery than group 2 and 3. The results indicate that the NAGs is a useful manual therapy technique for achieving faster result as measured in terms of ROM and pain at available end ranges

Cervicogenic dizziness is dizziness described as imbalance occurring together with cervical pain or headache. This study aimed to determine the efficacy of sustained natural apophyseal glides (SNAGs) in the treatment of this condition. A double-blind randomised controlled clinical trial was undertaken. Thirty-four participants with cervicogenic dizziness were randomised to receive four to six treatments of SNAGs (n=17) or a placebo of detuned laser (n=17). Participants were assessed by a blinded assistant before treatment, after the final treatment and at 6- and 12-week follow-ups. The primary outcome measures were severity of dizziness, disability, frequency of dizziness, severity of cervical pain, and global perceived effect; balance and cervical range of motion were secondary measures. At post-treatment, 6- and 12-week follow-ups compared to pre-treatment, the SNAG group had less (P<0.05) dizziness, lower (P<0.05) scores on the Dizziness Handicap Inventory (DHI), decreased (P<0.05) frequency of dizziness, and less (P<0.05) cervical pain. The placebo group had significant (P<0.05) changes only at the 12-week follow-up in three outcome calculated severity of dizziness, DHI, and severity of cervical pain. Compared to the placebo group at post-treatment and 6-week follow-up, the SNAG group had less (P<0.05) dizziness, lower (P⩽0.05) scores on DHI, and less (P<0.05) cervical pain. Balance with the neck in extension improved (P⩽0.05) and extension range of motion increased (P<0.05) in the SNAG group. No improvements in balance or range of motion were observed in the placebo group. The SNAG treatment had an immediate clinically and statistically significant sustained effect in reducing dizziness, cervical pain and disability caused by cervical dysfunction.

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