**Rehabilitation science**

**Question 1**

Neurological examination is considered to be one of the doctor supervised treatment program specifically designated for people with disorders in their body, trauma as well as diseases concerning the nervous system (Raine, Meadows, & Lynch-Ellerington, 2013).  This rehabilitation can be used in improving the functions, the wellbeing of the patients as well as reduction of the symptoms of the disease affecting the various people.

Musculoskeletal rehabilitation is also a doctor supervised program directed to the people with various impairments or people with different disabilities caused by trauma, diseases or disorders in the bones and the muscles (Magee et al., 2015).

Pediatric rehabilitation is usually designated in order to bring improvement to various abilities of children as a result of occurrence of illnesses, injuries and medical procedures affecting their functionality (Di Rezze et al., 2014).  Through the pediatric rehabilitation, the ability of children’s are enhanced and this makes them to participate in several activities in their schools, communities, as well as their homes.

The differences between the three types of treatment in terms of target patients show that the Neurological rehabilitation considers the patients with nervous system disorders and illnesses different from the Musculoskeletal rehabilitation targets the patients with impairments in the body and Pediatric rehabilitation is targeted to the children with dysfunctional abilities. However, the similarity among the three is that they are all rehabilitation programs done by doctors.

In terms of subjective examination, the three types of rehabilitations are similar in nature because they all examine the severity, the nature, and irritability of the various conditions of patients. This can be important because the examination can be used in determining the specific ways in which the rehabilitation can be handled. The difference between the subjective examinations used in establishing the causal effects of the various diseases and injuries of the patients is in the questions used to establish the causal effects of the various conditions. The questions can vary according to the rehabilitation mechanism adopted and this can be important in deciding the appropriate measure to take in treating the various patients. For instance, in carrying out the subjective examination for musculoskeletal rehabilitation, the areas of symptom can be used in determining the various places the patients feel affected by the condition. The symptoms of the patients are examined and the type of pain determined in the subjective emanation of the patients. The intensity of the pain is also monitored in order to make sure that the patient is kept in a good condition. The relationships of each symptom of the musculoskeletal condition is defined in order to make sure that the patient is good. The questions asked to the patients can differ in the musculoskeletal rehabilitation with the other rehabilitations because of the difference in symptoms and the types of pain experienced by the patients. This makes the priorities of treatment and diagnosis of the patients to be different.

The objective examinations of the three rehabilitations are similar in nature because they can be used in explaining the factors causing the pain in the various individuals.  The examinations in the three types of rehabilitations can be used in establishing the priorities to be considered when assessing the physical pain of various individuals for clinical reasons. However, the difference between the objective examinations carried out is in the questions used in examining the pain of the individuals in question.  The various approaches used in the objective tests differ with the objective desired to be achieved in every patient in question.

The treatment plans for the three types of rehabilitations differ according to the approaches used in rehabilitating. Since the symptoms of the various diseases and injuries are different, this shows that the treatment plans are different too. The priorities put in the treatment plans also differ because, in some rehabilitations like musculoskeletal conditions, there are no surgeries required depending on the symptoms of the patients. However, there is a similarity in the way the various treatment plans are carried out because they follow a specific order in order to help rehabilitating the patients completely. This helps in providing appropriate care for the patients. For instance,   the treatment plan in neurological condition includes nerve studies, training activities of the patent on a daily basis, carrying out speech therapies of the patients, doing activities to improve the conditions of the patients, doing exercises and education the patients regarding disabilities. This procedure can be different in other treatment plans of the various rehabilitations carried out.

The treatment approaches are also different in the three rehabilitations because of the differences in the treatment plans. Since the plans have different outcomes, the treatment approaches have to differ because each of them aims towards some specific goals in treatment. For instance, in neurological rehabilitation, the treatment approach is concerned with reducing the neurological pain and therefore the treatment outcomes can differ. This makes the approaches used to have different outcomes depending on the rehabilitation condition.

Each rehabilitation has a different treatment method used in treating the people. The difference between the treatment methods lies of the diagnosis of the various injuries and illnesses of the various patients affected by the conditions. Since each diagnosis is separate in the approach it uses in treating the patients, the treatment methods used are different. However, the similarity between all the treatment methods is that they include physical exercises f the various patients involved.

**Question 2**

**Inspiratory muscle training (IMT)**

Pulmonary rehabilitation is one of the programs used in caring for the patients with chronic respiratory problems in their body.  This program is usually tailored towards improvement and optimization of social and physical performance of the person as well as autonomy of the person.  This kind of therapy does not affect the functioning of the lungs and it has a positive impact on the sensory mechanisms as well as metabolic mechanisms in the body.

Inspiratory muscle training (IMT) is one of the programs used in PR. The mechanism of IMT is highly dependent on PR and this is shown from the effects of PR on perception of dyspnea in the body.  PR can be used in enhancing the capacity of exercising of various individuals and reduces the utilization of resources in health care. That can be important in IMT because it helps in reduction of lactic acidosis and maintenance of the heart rates of the different individual’s involved (Neves et al., 2014).

The mechanism used in IMT in PR shows that the load placed on inspiratory muscles during training of the body can be sufficient on the augmentation of the inspiratory muscles strengths in the body. IMT can be used by various patients in reduction of dyspnea in most of the patients with dyspnea in the body (Neves et al., 2014).  The functional capacity of exercising can be improved as a result of attenuation of the dyspnea in the body.  IMT can also have massive effects in the body including improvement of the strengths of the muscles of various individuals as well as increasing the endurance of patients.  The exercise capacity outcome of the patients can also be increased as a result of IMT and this can assist most patients in pulmonary rehabilitations (Neves et al., 2014). Therefore, through the general mechanism of the inspiratory muscle mechanism in pulmonary rehabilitation, the patient’s outcomes are improved as a result. To the patients, the IMT cannot be regularly included in the PR programs because the mechanism can reduce the effectiveness of the system when regularly induced (Nikoletou et al., 2016)

**Positive expiratory pressure (PEP)**

 This is a technique famously used in enhancing clearance of sputum during most of the AECOPD.  PEP therapy is very important when it comes to the management of acute exacerbations of chronic obstructive pulmonary disease (AECOPD). This is because PEP can be used in improvement of the short and long-term outcomes of various patients (Osadnik ET., 2014).  In terms of therapy, PEP involves the exhalation of the various patients involved against a low resistance whereby this is aimed towards shifting the equal points of pressure in order to help in maximizing the flow of air behind the sputum points. This, in turn, helps in protection of the various individuals against the collapse of the dynamic airways in the body (Bertella, Simonelli, & Bianchi, 2016).

Since the PEP can lead to increase in the increased expiratory time in the pulmonary rehabilitations, this can help in reducing the dynamism in the hyperinflation rates as well as improving dyspnea in the body (Osadnik ET., 2014).  This helps in addressing the therapeutic aims of the PEP in the body during the pulmonary rehabilitation activities.

**Differences and similarities**

Since pulmonary rehabilitation involves providing care of the patients with the respiratory conditions in the body, the same role can be played by PEP as well as IMT in the body. The IMT and PEP are used in taking care of the physical and social performance of the patients in order to improve their outcomes n the body. This can be enhanced through the use of the PEP and IMT in the body (Neves et al., 2014).  The use of IMT and PEP can be used in improving dyspnea in the various patients showing that they are similar in effects when used by the various patients. However, the two approaches in pulmonary rehabilitation can be very different in terms of satisfaction of the patients and the level of outcomes each program provides to the body. PEP is different from IMT because IMT can be used in improving the muscle strengths in the body while the PEP can be used in improving the airflow behind the sputum in the body.  This shows that they are different in the functions they perform in the body.

**Question 3**

Home visit ad care is important to most patients because it can assist in making the patients better while at the comfort of their homes. The programs are necessary because they improve the quality of life of the various patients as well as carrying out exercises with the various patients in order to improve their lives.  Through training of the patients, most home-based programs are made effective.

Home-based pulmonary rehabilitation is a home care program used in taking care of the patients with the chronic obstructive pulmonary diseases (Vestbo et al., 2013).  Most of the individuals suffering from the disease can use this program in order to reduce the time wasted while visiting the medical practitioners in the various hospitals as well as improving their quality of life. Geriatric rehabilitation helps in offering care to the elderly patients with a high risk of falling and this is offered through provision of home services to the patients (Schwenk et al., 2014). There are similarities and differences of the two types of care offered to the patients suffering from the two types of conditions.

One of the similarities between the two types of home cares is that they are both carried out using a team of experts specialized in offering effective services to the various people involved.  The rehabilitation care team is composed of trained physicians who can be contacted in order to make sure that the patients receive appropriate services as well as monitoring them in order to provide the best services to them.  The team used in management of both conditions might include, registered nurses, physical therapists well as using the occupational therapists. These people are responsible for keeping the lives of the various patients receiving the home care safe through offering variety of instructions to them in order to improve the level of care to them.

Another similarity can be in what the patients usually receive when they are being treated. The patients usually receive a lot of benefits as a result of getting involved in the home care services. There is a team of experts who usually visits the patients on a timely basis and this helps in improving the outcomes of the patients as well as improving their health.  The people assigned to the home care services usually receive the first priority in terms of care and they are made to take various exercises which are monitored by the care providers.

There is a difference in the services offered in the two sides of care. In the pulmonary rehabilitation, there are breathing retraining programs introduced to the various patients and they are offered some post-discharge follow-ups (Vestbo et al., 2013). These services are specific to this kind of rehabilitation, unlike other services which are generalized in both rehabilitations including offering pre and post walking to the patients, offering management of the disease education, providing exercise to the various patients and having telehealth monitoring of most patients from their homes. All these services can be used in making sure that the patient get the maximum befits from the programs offered by the hospital facilities from their homes.

In terms of what the patients are expected to expect from the various rehabilitation programs from their homes, the services offered are similar in both rehabilitations.  Other rehabilitations are aimed towards improvement of the quality of life of the various individuals involved. This is because of the various services offered through monitoring the patients from the telehealth services. The services can also improve the ability to be able to recognize and also manage various symptoms of disease and also increasing the rates of exercises in the body as well as tolerance of the various individuals to the conditions of the disease.  This makes the people being managed at home to improve on the way they perceive a lot of things concerning the disease and this is usually helpful in management of the conditions the patients usually face when they are exposed to the various sicknesses.  The patients from the two rehabilitation program from their homes should also expect to have decreased hospitalization due to the medical conditions they usually face. This decrease in hospitalization can be seen from the effects of the various programs and also its effectiveness in meeting the various goals in clinical activities.

The programs all starts with training of the patients at different levels whereby the patients are exposed to similar conditions at their homes and also they are offered basic tools which they will be using in order to start using the home services. This is usually important in hardening the patients to start treating themselves from their home and also making them aware of the various measures they can be able to take when they are faced with similar challenges in the field.  However, the training services are usually different because each rehabilitation requires some special conditions and tools in order to be manageable.

**Question 4**

In motor recovery for most of the individuals with stroke, the TMS and the tDCS are very important in management of that condition. However, the tDCS is mostly used in motor recovery for the individuals with stroke in most cases as compared to the TMS (Andrade et al., 2015).  Both methods are usually noninvasive clinical methods of treating various individuals with stroke.  Mostly, the TMS is usually used to most individuals suffering from severe treatment-resistant depression conditions like stroke in the body. This makes this method to be one of the currently used method in stimulation of the brain in the medical fields today.  The methods of treatment used in motor recovery for the two methods is similar because they both require the patients to sit in specially designed chairs and positioning themselves in frames in order to rest the patients forehead and chin in a comfortable manner. This helps in enhancing the comfortability of the patients in the management of stroke conditions in the body.

TMS in stroke management can only penetrate a few centimes in the cortex of the brain of the various individual and this makes it to be different from the tDCS which penetrates deeper as compared to the TMS in order to provide improved functions of the part being operated.  In targeting some of the specific areas of the brain to minimize the effects of stroke in the body, tDCS Is mostly used because it has the ability to accommodate some of the small electrodes in the body and these can be used effectively when they are placed directly on the stimulation areas directly in the body (Horvath et al., 2016).  In the management of the stroke and treatment of motor recovery, the use of TMS and tDCS is important because it can assist towards modulation and exciting of the cortex as well as inducing plasticity to most of the humans.

TMS has been used in many instances in order to help in inducing electricity pules to the barn of the various individuals through varying degrees of electricity pulses in the TMS coil but the tDCS is used differently in order to polarize the various regions in the brain of different individuals through the use of weak direct currents to the various individuals (Andrade et al., 2015). Both TMS and tDCS have the ability to create some special focus and they are not costly and that makes them to be provide good results in the treatment of stroke in the brain. The use of both methods can have an effect on the NMDA receptors in the brain and that can lead to massive changes in the brain activities.  the use of tDCS and TMS can be better for all the patients with stroke in the body and that can be relevant when the cathodal TMS and tDCS is used in the management of the condition.

The mechanism used in providing the treatment of stroke and motor recovery in the body is different in the TMS and tDCS.  TMS can be used as a neural stimulator in the body and this is different from the tDCS which is used as a neural modulator in the body.  The differences in the mechanisms of actions shows that the actions presumed for both mechanisms are different and that means the level of action and results expected from both methods differ in large ways.

The TMS is considered to have one of the best temporal and spatial resolutions in the body because the TMS protocol in the body is better established as compared to the tDCS having the advantage of usability.  In most of the behavioral tasks such as stroke management the perfect tool to be used in the management of such a condition would be the use of the tDCS (Triccas et al., 2016). Since TMS and tDCS are different, the level of treatment of stroke and motor recovery differs a lot according to the excitability of the methods. The methods can have an effect on the cortex for a period estimated to be more than two months (Triccas et al., 2016).  The various long term and short term effects of the tDCS and TMS can be used in engaging the patients in mechanisms of plasticity.

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