

An Outline of Clinical Decision Making for Physiotherapists

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By

Auwal Abdullahi

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I dedicate this book to my family, students and teachers—
they are the pillars of my support.

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PREFACE

Clinical Decision Making skills are the cornerstones of every clinical practice, be it in Physiotherapy, Medicine, Nursing or other Allied Health professions. It is a complex process that involves the use of patient's information, their clinical characteristics, the clinician's skills especially in critical thinking and reflective practice, experience and other prevailing factors in order to offer the patient the most appropriate clinical services. In particular, Physiotherapy as a profession is constantly and rapidly evolving in the sense that many techniques for interventions are being invented, and many others as well that are considered less effective are becoming outdated. Consequently, there is an urgent need to devise means to help Physiotherapists to keep abreast of these tides of constant and rapidly evolving practice in their profession. The aim of this book is to help arm the Physiotherapists with the necessary Clinical Decision Making skills in order to enable them provide the most effective clinical services to their patients and/ or clients.

Auwal Abdullahi

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This book is a culmination of my experience in both clinical practice and the academia. Therefore, I would like to thank all my colleagues, patients, students and teachers who helped me developed skills in Clinical Decision Making which ultimately enabled me to write this book. Lastly, I want to also thank Cambridge Scholars Publishing and all their staff that helped this book become a reality.

CHAPTER 1

CLINICAL DECISION MAKING

1.0 Introduction

Physiotherapy is a health profession aimed at preventing loss of function, modifying function, maintaining existing function, and restoring or improving function of the body. It involves the use of physical agents, such as therapeutic exercises, electrotherapy, counseling, and hydrotherapy to promote an individual's health. Consequently, to practice as a physiotherapist requires certain qualities, competencies, skills, and behaviors (CSP, 2014). When all these variables are attained, professionalism will be achieved. Professionalism, however, has certain dimensions, which include using the best available evidence in one's physiotherapy practice, quality clinical decision making and reasoning within uncertain and unpredictable practice conditions, observing the highest ethical principles, and continuing professional education and development. These requirements in the domains of professional practice will help the therapist attain the highest degree of professional fitness.

The physiotherapy profession is both theory and practice based. Physiotherapists acquire skills that help them apply theoretical evidence to their practice. However, applying theoretical evidence to practice cannot be achieved without good clinical decision making. Thus, good clinical decision making is at the core of physiotherapy. Therefore, the aim of this book is to help equip the physiotherapist with the skills and knowledge to make good clinical decisions in their practice.

1.1 Clinical Decision Making

Different authors have defined what a clinical decision involves and all agree that it is a complex process. In 2004, Standing defined clinical decision-making as "a complex process involving observation, information processing, critical thinking, evaluating evidence, applying relevant knowledge, problem solving skills, reflection and clinical judgment to

select the best course of action which will optimize a patient's health and minimize any potential harm." For Clark (2009), "clinical decision making is a cognitive process involving integration of problem recognition through identification of cues, prompts or clinical features, adequate information and data gathering; and analysis and evaluation of this information in order to choose the most effective and safe decision for the benefits of the patients. Thus, it is complex and rational process involving hypothetico-deductive reasoning" (Elstein & Schwarz, 2002; Standing, 2010). Hypothetico-deductive reasoning implies setting an intelligent presumption, supposition, or guess; testing it; and, finally, making an inference from this. The process involves a scientific way of thinking which is systematic and obeys a set of rules. Similarly, Orsamu and Conolly (1993) define clinical decision making as "a cognitive process of critical thinking, judgment, and problem solving." In all these definitions of clinical decision making, the fact that it is a complex process is frequently echoed. This could be because of the information needed to make decisions may often be less defined and confusing. Secondly, the decision environment may also be uncertain and, as such, it may change. Thirdly, organizational goals and norms may conflict. For instance, if a patient presents with neck pain based on his personal report, it is possible that this is due to referred pain as a result of myocardial infarction, which may only be confirmed if the environment has the facilities, such as ECG or echocardiogram, to accurately diagnose the condition. Additionally, the norms and practice of the organization, such as the availability of physiotherapy services, will hamper the therapist's clinical decision making. Good clinical decision making is needed in every practice.

Good clinical decision making skills can arm the therapist with tremendous self-confidence. "Self-confidence is one's belief in his courage, power, and ability to take action using his own abilities as a source for his values and purposes" (Karagün, 2014). It is the process in which the physiotherapist determines what their patients or clients need, as well as when and why they need it. To achieve all this, the therapist is required to gather adequate information on what is wrong with the patient and also be able to appreciate what other alternative explanation can be deduced. The information can be gathered through history taking, conducting assessments, and carrying out tests or measurements. This, together with a basic knowledge of anatomy, physiology, and pathology, as well as experience, may aid the therapist in making a clinical decision. For example, to determine that a patient with low back pain needs lumbar traction, as well as when and why they need the traction, the therapist needs to gather information on the physiological, anatomical, and

pathological states of the lower back. This information can be gathered from radiological investigations, medical laboratory tests, history taking, and functional performance tests. Of course, experience will also play a vital role in making a clinical decision. However, the patient's or client's preference should be an additional consideration when making a clinical decision. For instance, I do not like traction (apologies! I had an uncomfortable personal experience with it as a young student). Please consider my example as a purely personal opinion and experience, even though the use of traction has been shown to have little impact on pain and disability (Wegner et al., 2013). Equally, I must acknowledge my patients' preferences in healthcare delivery as I have a responsibility to ensure their rights are met and their varied social characteristics are taken into consideration. Figure 1 depicts the interplay between the factors or variables required in the clinical decision making process. One factor may influence the other and vice-versa. In the same way, the therapist's self-confidence can facilitate the process of clinical decision making.

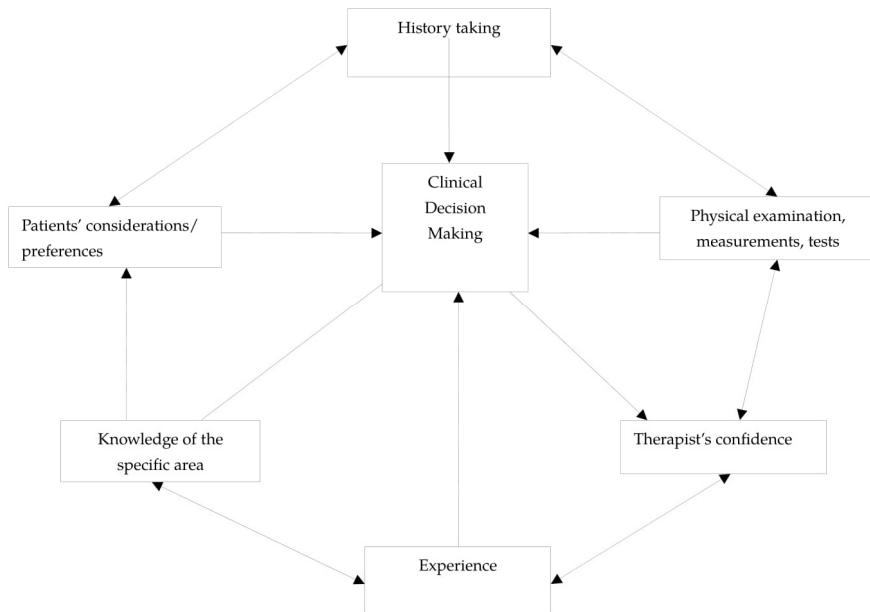


Figure 1: Web-like Representation of Clinical Decision Making Process in Physiotherapy

1.2 Types of Models for Clinical Decision Making

A model refers to the representation of something using general rules and concepts. Therefore, clinical decision models refer to the representation of clinical decision making using general rules and concepts. These representations or models help to connect and make the interrelationships between different parts or aspects of clinical decision making clear. They may also help the therapist to have a more open minded view of all aspects of clinical decision making that will help them make quality decisions. Additionally, they may help them perform self-examinations and reflections (Alexander, 2008). There are basically three types of clinical decision making models: the information processing model, the intuitive-humanist model, and O'Neill's clinical decision model (Berner 1984; Young 1987; Joseph & Patel, 1990; O'Neill et al., 2005).

1.2.1 *The Information Processing Clinical Decision Model*

The information processing clinical decision model takes the form of hypothetico-deductive reasoning in decision making, which assists with metacognitive reasoning in diagnosis of the condition (Graber, 2003; Gordon & Franklin, 2003). Metacognitive reasoning means the ability to make a decision and reflect upon its appropriateness. In this model, decision making can be helped by using decision making trees. This model is used to help with the correct diagnosis of the particular condition and it follows a rational logic by using reasoning that makes sense. Therefore, skills and experience are important. The processes in this model include cue recognition or cue acquisition, hypothesis generation, cue interpretation, and hypothesis evaluation (Tanner et al., 1987; Gladstone, 2012). Cue recognition or cue acquisition refers to the process of generating or gathering information, which can be gained from the patient's history taking, and conducting some tests or investigations. For example, when a patient presents with weakness of the upper limb, the clinician may try to find out about any previous fall, trauma to the neck, or the upper limb during the history taking. Similarly, the therapist may likely measure the function of the limb using, for example, the wolf motor function test (WMFT) or even ask the patient about his ability to use the limb in the real world using a motor activity log (MAL). The information or the data gathered would then give him the opportunity to proceed to the next stage, which is the hypothesis generation stage.

The hypothesis generation stage involves the process of forming an impression of the likely cause of the condition and making a list of these

possible causes. Based on this list, the clinician will then interpret it to arrive at a decision on the cause of the condition. This is the stage of cue interpretation and it will subsequently help when planning a rehabilitation program. Following this, the decision on the diagnosis of the condition and the rehabilitation plan will be evaluated in order to see if there is any or no progress. If there is any progress, the clinician may make a decision to continue with the current plan or change to another one. In the same way, if there is no any progress, a decision can be made to change to another rehabilitation plan or consider another condition as the possible cause of the problem. This is the process of hypothesis evaluation. Therefore, this model follows a rational and logic path to help arrive at an apt clinical decision. See Figure 2 for pictorial descriptions of these processes.

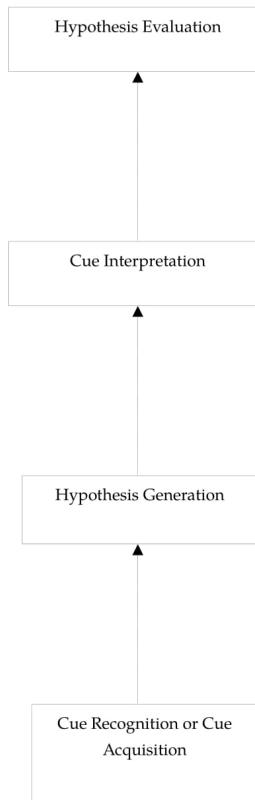


Figure 2: Pictorial Representation of the Processes of the Information Processing Model of Clinical Decision Making

The nature of the information processing model of clinical decision making may probably determine the strength or quality of the decision, which may come in three ways or as a mixture of these forms depending on the case scenario under consideration. The three ways are descriptive, prescriptive, and normative (Bell, 1995; Baron, 2012; Dillon, n.d.). These are pictorially represented in Figure 3.

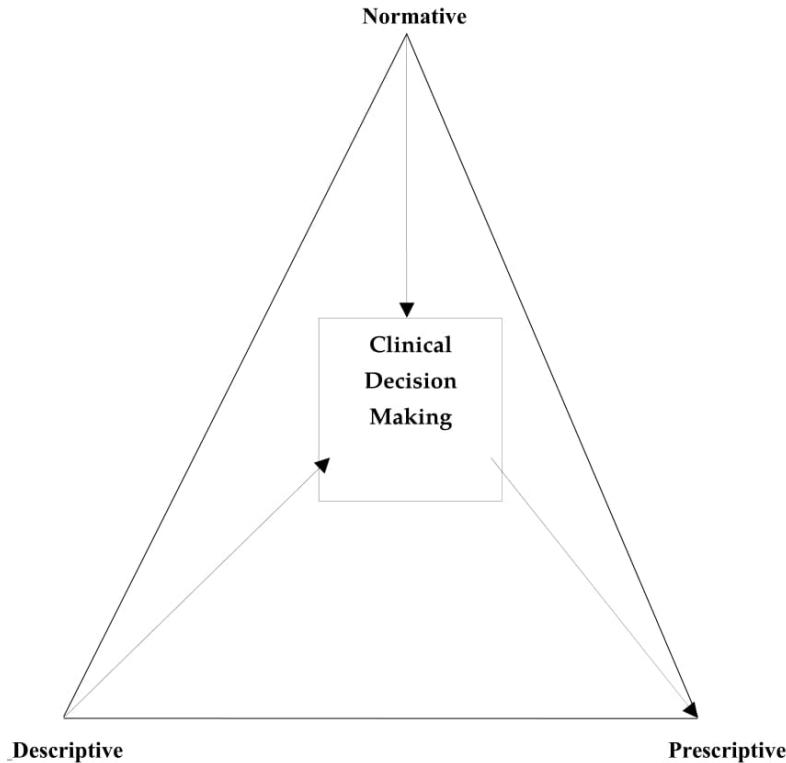


Figure 3: Nature of Models of Clinical Decision Making Triangle

1.2.1.1 Prescriptive Model

The prescriptive model is associated with frameworks, guidelines, or algorithms designed to enhance, ease, and facilitate clinical decision making. The model is evaluated on whether the guidelines or algorithms facilitate, ease, or enhance clinical decision making in the real world (pragmatic adequacy) rather than in the theory. For example, there are

stroke rehabilitation and management guidelines in many developed countries (Quin et al., 2009), Cameroun, and South Africa (Cockburn et al., 2014; Bryer et al., 2010) in order to enhance the process of clinical decision making for stroke patients. Additionally, there are many algorithms, such as the Predict Recovery Potential (PREP), which have been validated and established to predict functional outcomes in the upper extremity three months after a stroke (Stinear et al., 2012). Such guidelines and algorithms can help ease the clinician's tasks by having the knowledge of what to do or expect in a particular situation when considering the patient's clinical and other characteristics. Thus, guidelines and algorithms are required in clinical decision making process even if they are to be applied locally in the health facility. These will particularly guide the novice therapist.

1.2.1.2 Normative

In the normative model, clinical decisions are derived from rigorous large-scale experimental and survey studies following appropriate statistical analysis. Examples are clinical trials to test the efficacy of a new therapy, such as the use of task specific training in the treatment of central post stroke pain. In essence, it is a rational, logic, scientific, and evidence-based decision making model. It is evaluated based on the available theoretical evidence (theoretical adequacy) (Standing, 2010) that will enable the therapist to predict and/or explain the outcomes of a decision. An example of this is a study looking at the prevalence of low back pain among the caregivers of patients who have suffered from a stroke. We know that, following a stroke, the patient may have impairment in voluntary motor control which may limit their functions. As such, they require help to carry out their daily living activities, including transferring from the bed to chair or from sitting to standing, and vice-versa. In doing this, the caregivers may have to help lift the patients, which can strain their back and eventually lead to back pain. Therefore, knowing the extent of this problem using a survey method could lead to designing a program that will help with prevention of low back pain in this population.

1.2.1.3 Descriptive

This model is concerned with studies that are involved with observation, description, and analysis of how decisions are made by managers and professionals in relation to their day-to-day responsibilities. It is evaluated based on experimental observation (empirical adequacy) that supports assumptions made about decision making processes with relevant

examples from a suitable period of observation (Standing 2010). This involves the analysis of observations and decisions, as well as thinking, reflections, and opinions to help support clinical decision making. An example of this could be interviewing the physiotherapist in a particular setting on how or what they do in the rehabilitation of children with cerebral palsy (CP). Although, this sub-model can help support the clinical decision making process, it has been argued that the views, beliefs, and opinions of even the highest authorities are less scientific, very subjective, and open to critique (Polgar & Thomas, 2008). Thus, the application of a model of this nature needs to be done with the utmost care and also critique of the opinions and views of even the highest authorities in the field.

1.2.2 The Intuitive-Humanist Model

The intuitive-humanist model is concerned with intuition and experience. That is to say, it is concerned with how knowledge gained from experience can be applied in clinical decision making (Berner, 1984; Young et al., 1987). Thus, the model does not necessarily rely on research evidence but rather on sudden insights gained from clinical experience. Consequently, it can be argued that it is a weak model since it is not based on any strong evidence. In essence, it is a model based on skills acquisition, which can be gained through intuition. Intuition is the act of making decisions on a new, complex, surprising, less understood, or uncertain situation (Rew, 2000). Skills acquisition occurs in a continuous process from the novice, advanced beginner, competent practitioner, proficient practitioner and, finally, to the expert (Dreyfus & Dreyfus, 1980). The novice is at lowest rung of the ladder as he is in the earliest stage of his profession. In this stage, his skills are limited to what he was taught at school and by his superiors in the clinic. Therefore, his skills rely heavily on fixed rules and regulations. The advanced beginner is just above the novice because he only has a few years of experience and, therefore, his practice is a mixture based on the rules used by the novice and the little experience he has in the real clinical world. He may have intuition, but to a very limited extent. Similarly, the competent knows the rules of the game; he knows his thing and has appreciable years of experience. The proficient has so many years of experience, in addition to appreciable continuing professional development; therefore, he could use a great deal of intuition to aid with his decisions in clinical practice. The expert is someone who has seen almost all, acquired a vast knowledge, and accumulated a lot of experience. Thus, skill acquisition occurs on a spectrum of increased

ability. For example, in my experience with stroke rehabilitation, as a novice I used to only plan rolling, bridging, and passive movement exercises and standing/walking reeducation for my patients. However, as I moved up the ladder to the advanced beginner during my internship training, I learned to include proprioceptive neuromuscular facilitation (PNF). As I moved further up the ladder in my practice as a competent therapist, I began to understand the importance of increasing the frequency and intensity of the rehabilitation program. For instance, I began to see my inpatients twice a day. Additionally, when I started to ascend to the level of a proficient practitioner, I began to categorize the needs of my patients based on their presenting conditions. When a patient has severe motor impairment, I prescribe mental practice and motor imagery but, when he has either mild or moderate impairment, I prescribe task specific training. At the expert level, I can now extend the use of task specific training that has mainly been used for motor rehabilitation to the treatment of central post stroke pain (CPSP). See Figure 4 for a pictorial representation of these processes.

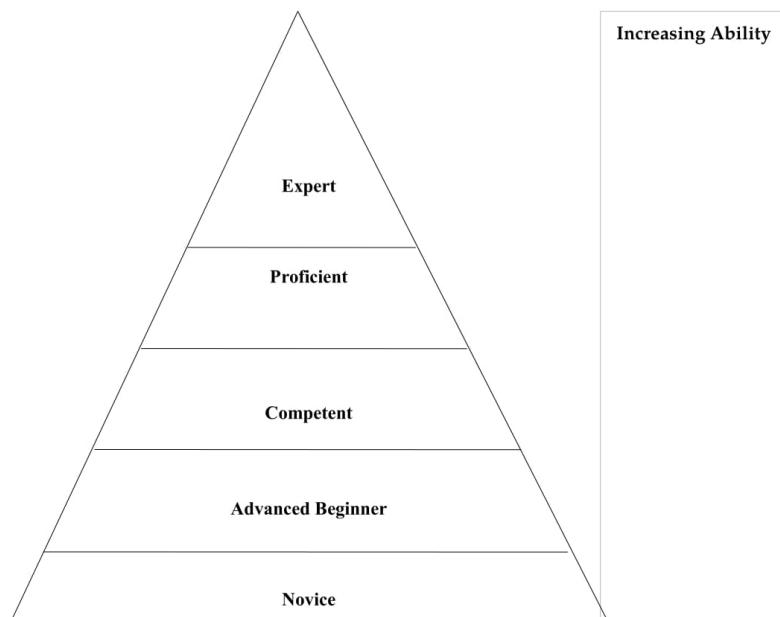


Figure 4: Pyramid of Skill Acquisition for Clinical Decision Making

1.2.3 The O'Neill's Clinical Decision Model

The O'Neill's clinical decision model is a mixed method model that integrates the hypothetico-deductive reasoning and intuitive-humanist models (O'Neill et al., 2005). It recognizes the importance of both scientific evidence and experiential learning when making informed clinical decisions. The hypothetico-deductive reasoning and intuitive-humanist models are integrated to help develop a decision support system. A decision support system is a way of easing the processes of clinical decision making. Examples of these could be a computer system containing easily accessible information, such as pathophysiology, clinical signs and symptoms, and appropriate rehabilitation or treatment, as well as displaying charts or diagrams summarizing signs and prescription instructions. The processes in this model include the use of pre-encounter data, anticipating and controlling risks, provision of standard care, situational and client modification, hypothesis generation, and taking or choosing appropriate action. See Figure 5 for the illustration of these processes.

The use of pre-encounter data relates to the information the clinician gathers before attending to the patient. This includes consulting the patient's case file; discussions with the referring professional, his juniors, or team members; knowledge from the literature on the condition or treatment; and his experience. The pre-encounter data may serve to ease, simplify and/or potentiate the process of decision making. Anticipating and controlling risk is about ranking the possible cause or outcome according to the degree of risk, and to then plan the most potent technique in order to reduce the likelihood of developing more problems and maximizing the benefits of the decision. For example, if a patient has decreased mobility due to chronic osteoarthritis, it is important that decisions are made to prevent complications, such as deep venous thrombosis (DVT), by prescribing some graded lower limb active exercises and/or the use of elastic stockings. In addition to this, standard care that encompasses comprehensive patient management, which considers his presenting symptoms, should be provided. This may comprise of applying short diathermy (SWD) to relieve pain, passive range of motion exercises to improve or maintain the range of motion (ROM), and motivational interviewing to help patients cope with the challenges of their condition. The situational and client modifications have to do with situation requirements, such as having many clients or patients at the same time; many different professionals managing the patient at once; changing treatment plans; or referring the patient to other experts. An example of this could be having a patient that is experiencing severe

joint pains due to rheumatoid arthritis. In this case, a need may arise to temporarily stop the passive or active ROM exercises and/or refer the patient to a rheumatologist or cardiologist should he manifest cardiovascular complications. The hypothesis generation stage was described earlier under the information processing clinical decision model. Taking appropriate decision on what caused the condition or the most suitable treatment or rehabilitation plan follows this. The processes in this model are summarized in Figure 5.

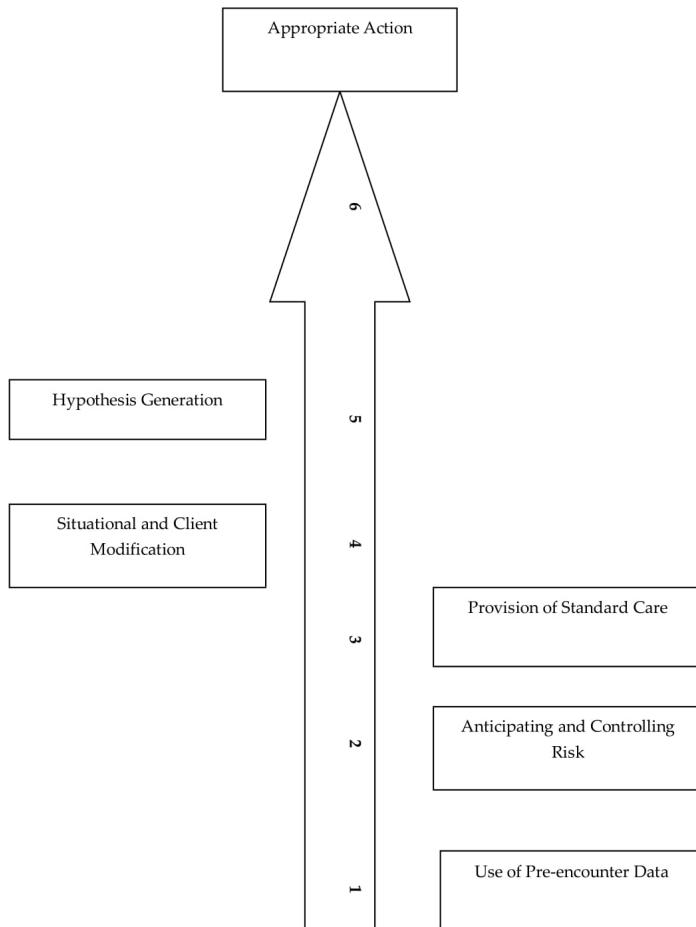


Figure 5: Illustration of Processes of Decision According to the O'Neill's Clinical Decision Model

1.3 The Role of Emotional Intelligence in Clinical Decision Making

Emotional intelligence (EI) is about being aware of your own and appreciating other peoples' emotions. In clinical practice, EI refers to the therapist's awareness and appreciation of the patient's feelings, views, and beliefs and taking every measure not to dampen his spirit. Having good EI could endear you to your patient and help halve their problems (Crane et al., 2017). Therefore, as EI is required in all our daily endeavors, it seems that it is required the most in our clinical practice, as opposed to the traditional interpretations of clinical decisions, where it is said to be only a rational and cognitive process (Kozlowski et al., 2017). Similarly, emotion can improve or mar clinical decisions and, as such, being aware of your own emotions and those of others could help facilitate clinical decisions. Additionally, emotional intelligence (EI) may serve as a form of psycho-emotional rehabilitation for our patients. When the therapist has good emotional intelligence, this may predispose him to avoid any action or decision that may hurt his patient, and also avert any action from the patient that could hurt the therapist's emotions and lead him to make decisions that are not in the best interest of the patient. However, emotional experience in itself is subjective and subjective experience in clinical decision making includes an emotional response to contextual pressures, emotional responses to others, and the intentional exclusion of emotion from clinical decision making (Kozlowski et al., 2017).

1.3.1 Emotional Response to Contextual Pressures

Emotional response to contextual pressures is expressed as a result of uncertainty, fear, conflict, discomfort, regret, and predictability surrounding the patient's condition. For example, if you have a stroke patient with very severe impairments, then uncertainty, fear, conflict, discomfort, regret, and predictability may come into your decision making, since the current available evidence does not have any technique that can perform miracles for your patient. However, the best way around this is to try and identify short term goals that will benefit your patient and work on them, while planning for long term goals, such as recovering walking or activities in daily living (ADL). In the previous case, you can set a short term goal to help the patient learn how to sit up from lying, stand from sitting, and begin to take some steps around his bedroom and living room.

1.3.2 Emotional Responses to Others

This is an emotional self-awareness of the gut feeling that triggers action. When you have a child with polio in your clinic, and you think that he may become disabled if you do not act fast enough, the emotions triggered may prompt you to act more quickly and plan a rehabilitation that will prevent as many complications as possible. For example, you may prescribe hip, knee, ankle, and foot orthosis (HKAFO) to prevent contractures and muscle atrophy and possibly walking aids to enable them to walk.

1.3.2 The Intentional Exclusion of Emotion from Clinical Decision Making

This is when the emotions are present but they do not influence clinical decision making. For example, if you have a seven-year-old child with talipes equinovarus, such as a secondary tetanus infection in their foot, and you want to apply serial casting but you also know that they will experience severe pain as you stretch the foot to correct it. However, you also know that if you do not treat the foot, the child may be disabled and this will compromise his quality of life in the future. This means that you will be tempted to continue with your procedure. This is a case of sometimes you have to be cruel to be kind.

Since we now understand that clinical decision making is not only a cognitive process but also an emotional one, a discussion of how both emotion and cognition is applied in clinical decision making will be valuable. Consequently, it is important to note that there are three ways in which emotion and cognition are applied in clinical decision making. These are compassionate emotional labor responsiveness to patient emotion within clinical decision making, interdisciplinary tension regarding the significance and meaning of emotion in clinical decision making, and emotional and moral judgments (Kozlowski et al., 2017).

1.3.3 Compassionate Emotional Labor Responsiveness to Patient Emotion within Clinical Decision Making

Expressions of compassion among clinicians are common in clinical practice (Alexander et al., 2014). This emotion pertains both to the clinician's emotion and that of the patient. If the patient's attitude or environmental situations, such as poor attitude to work by team members, easily irritate the clinician, the negative emotion may be transferred to the

patient care and adversely affect the rehabilitation process. Similarly, if the patient's attitudes also offend the clinician, the process of rehabilitation can be hampered. However, showing compassion for the patient's suffering could help the clinician to make decisions that will benefit the patient.

1.3.4 Interdisciplinary Tensions Regarding the Significance and Meaning of Emotion in Clinical Decision Making

In clinical practice, differences in professional thinking, judgments, and opinions on what, when, how, and why a decision should be taken can create tension between different professions involved in the patient's care (Bryon et al., 2012). For instance, I once managed a patient with a spinal cord injury and I felt that it was the right time to start introducing standing. Therefore, I requested an X-ray of the right foot because the patient had a resolved metatarsal fracture, which enabled me make an informed decision on whether I could begin to stand him or not. Unfortunately, I only informed the ward nurses but not the attending neurosurgeon. This led to an interdisciplinary tension that almost jeopardized the team effort in the patient's care. However, ideally passion for caring should not override our professional emotional territory. Similarly, we may tend to act based only on medical models of care without considering the needs and wants of our patients. This emotion-based response only considers the clinician's views and so may hinder goal attainment for the patient in clinical rehabilitation.

1.3.5 Emotion and Moral Judgment

Emotions, such as understanding what our patients feel, may give clinicians the impetus to act ethically. This emotion develops as a result of experience over time in patient care. For example, if you frequently see children with cerebral palsy and observe the problems they face in daily living, you may develop the desire to do more for them in order to reduce both their and their families' suffering.

1.4 Use of Clinical Decision Making Support Systems

Clinical decision support systems relate to the use of technology to ease and improve clinical decision making. Support is much needed for clinical decision making, since it is a very complex process that involves so many variables. In the US, they have the "HITECH" act that legislates on the meaningful use of clinical decision making support systems to aid

physicians (Hsiao et al., 2012). Such support systems provide evidence-based knowledge on how to make decisions on many conditions. An example of a clinical decision support system is a computerized decision making system known as TREAT, which targets the appropriate use of antibiotics by predicting the most likely pathogen by considering the condition and the setting (Paul et al., 2006). Similarly, in a recent systematic review, it was reported that clinical decision making support systems remarkably reduced medication error (Jia et al., 2016).

In producing a clinical decision support system, some of the factors that can make it more effective include the automatic provision of decision support as part of the clinician's work flow, and the provision of recommendation rather than just assessment (Komoto et al., 2005). However, it has been opined that clinical decision support systems can be distracting and are not user friendly (Lobach, 2013). Additionally, they could be costly and this can make their availability difficult. Therefore, ways to provide easier, cheaper, and more user-friendly decision support systems are needed. For this, I feel that the use of charts can aid the physiotherapist to make informed clinical decisions. For instance, a chart showing when a person comes with severe, moderate, or mild motor impairment following a stroke should be given some indicated rehabilitation techniques. See Figure 6 for an illustration of this.

1.5 Factors Influencing Clinical Decision Making

Several factors can influence clinical decision making. These factors include task attributes, situational factors, therapist's factors, and the clinic's practice norms (Smith et al., 2008).

1.5.1 *Attributes of the Tasks*

This is concerned with the difficulty, complexity, and uncertainty surrounding the tasks. For instance, if the decision to be taken require the patient to attend the clinic often, say five times a week, and he lives very far away, then it could be impossible for him to attend due to the financial challenges involved.

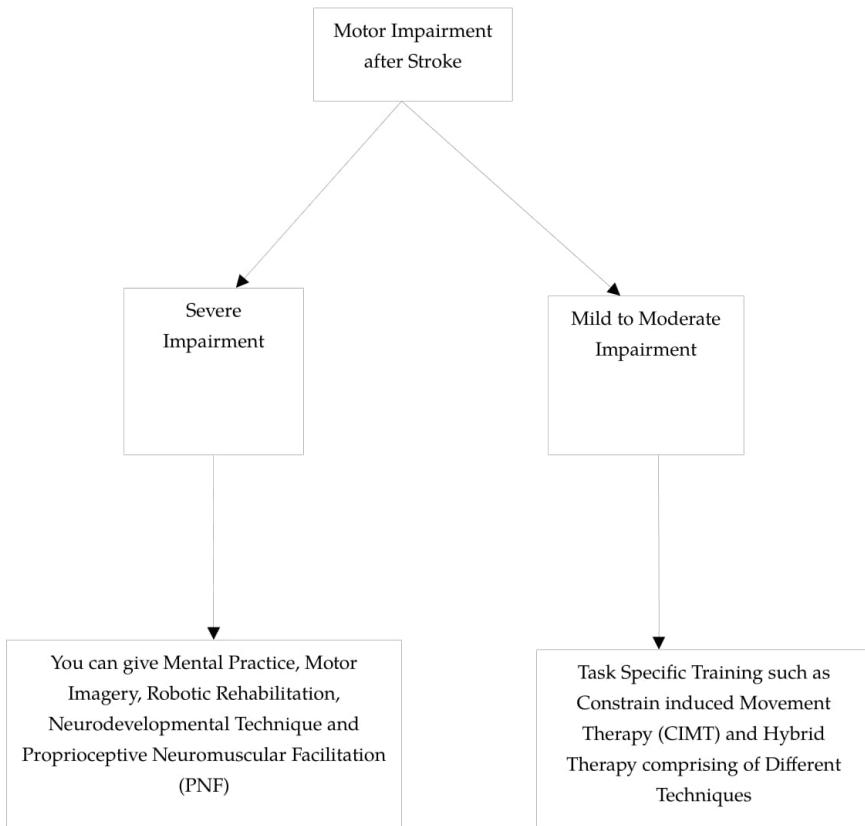


Figure 6: An Example of a Simple Chart Used for Decision Making Support System

1.5.2 Situational Factors

This can take a form of a situation where there are multiple interests. For instance, if a patient has both asthma and sickle cell disease, then the decision to manage one of the conditions may affect the other. I once came across a patient who had sickle cell disease and post polio residual paralysis. The patient had severe contractures of both knees, which obviously requires surgery. Additionally, she had very thin lower legs. Initially, I wanted to collaborate with an orthopedic surgeon to help release the contractures, so that I could prescribe calipers as I hoped this would