

---

# **Identification, Causes And Prevention Of Cumulative Trauma Disorders (CTDS) In The Construction Industry In Nigeria**

---

**By**

**C. A. JOHN (Ph.D)**

*Department Of The Technology Education,  
Federal University of Technology,  
P. M. B.2076 Yola,  
Adamawa State, Nigeria.*

**N. A. NWANKWOR**

*Department Of The Technology Education,  
Federal University of Technology,  
P. M. B.2076, Yola,  
Adamawa State, Nigeria.*

**T. J. TIKA**

*Department Of The Technology Education,  
Federal University Of Technology,  
P. M. B. 2076 Yola,  
Adamawa State, Nigeria*

## **Abstract**

*Construction workers stand high risk of occupational hazards such as accident, diseases and disorders. Report from occupational safety Organizations such as Occupational Safety and Health Administration (OSHA), National Safety Council (NSC); International Labour Organization (ILO) among others indicate that a good percentage of victims of occupational hazards are in the construction Industry. The Cumulative Trauma Disorders (CTDs) which rank high among the occupational hazards are doing great havoc among the construction workers in Nigeria. This paper identified the CTDs that are commonly found in the Nigeria construction Industry. They include: Tendonitis, Thoracic outlet Syndrome, Tennis Elbow, Golfer's Elbow and Reynaud's Syndrome among others. Furthermore, the paper enumerated the possible preventive measure that would go a long way, in reducing or even preventing the effects of these disorders. Recommendations such as the need for proper education of workers on site, training of engineers, trade foremen on preventive measures and acquisition of improved equipment, among others were advanced.*

## *The Coconut*

### **Introduction**

The construction industry, the world over, is a place of high level of specialized activities involving constant repetitive motions, compression of body tissue against hard and sharper corners, body frequent vibration, e.t.c. according to Charles and James (1999), these activities seem normal in the life of the construction worker, the supervisor and the engineer. The effects are not noticed. The fact of the matter is that the continuous subjection of the body to these activities would eventually lead to conditions that are detrimental to the body system, thereby resulting to the development of occupational ailment or disease.

The Occupation Safety and Health Administration (OSHA) advised that construction workers stand high risk of occupational diseases, if proper care is not taken in implementing rules and safety work procedure on site. For instance, on sites where asphalt is handled, there is high risk of damage to skin, eye, chronic lung diseases and cancer. Similarly, where welding, soldering, cutting and brazing operations are carried out, construction workers stand the risk of being infected with occupational diseases such as skin dermatitis, sensitizer and nervous system infections, thereby affecting the lungs, kidney and the blood system. (OSHA,1997).

The International Labour Organization ILO (2004) estimated that about 160 million workers are infected with work-related illness annually across the globe. A good percentage of this figure is in the construction industry, due largely to poor welfare system, and lack adherence to rules and safe work procedures on the construction site.

One set of the common occupational diseases which occur on site, yet under reported within the construction industry, is the cumulative Trauma Disorders (CTDs). Putz-Anderson (1988) in a study found that these diseases are caused by repeated and accumulated exposure to risk factors such as repetitive movement of the body and body segment, unnatural or awkward body position and high levels of force among others.

With the ever increasing sophistication in construction methods, improved tools and equipment and the growth taking place in the construction industry in Nigeria, it has become imperative to focus on the CTDs which are silently affecting thousands of construction workers in the country. This paper therefore seeks to indentify the common CTDs, their causes and the possible preventive strategies that would be employed with the hope that the skilled workforce in our construction industry, who are cumulatively put out of work as result of CTDs are well sensitized on the need to be conscious and adhere to laid own rules and safe work procedure on the construction sites.

### **Identification of the Cumulative Trauma Disorders (CTDs)**

The Occupational Safety and Health Administration (OSHA) reported that 6.8 million non-fatal occupational injuries and illnesses occur each year in the United States of America. Cumulative Trauma Disorders (CTDs) form one of this class of illnesses' (OSHA, 1997). These disorders are caused by repeated and accumulated

*Identification, Causes and Prevention of Cumulative Trauma Disorders (CTDS) in the Construction Industry in Nigeria. C. A. John (Ph.D); N. A. Nwankwor & T. J. Tika*

exposure to risky conditions which leads to tiring breaks and tears called the micro trauma. Sufficient recovery time is needed for workers to get better, however if the time required is not attained the Micro trauma can result in serious damage to the musculo-skeletal system.

In performing their professional responsibility on site, construction workers are required frequently to utilize their hands, arms and shoulder. The National Safety Council (NSC) reported that most of CTDs suffered by construction workers are of the upper extremities. It is necessary to identify the CTDs so that proactive steps can be taken to reduce their effects to the barest minimum in construction sites in Nigeria.

Charles and James (1999) identified the most common CTDs which affect construction workers on site. They include tendonitis, thoracic outlet syndrome, tennis elbow or carpenter's elbow, rotator cuff tendonitis, Raynaud's syndrome and golfer's elbow. Others are trigger finger, ganglion cyst and carpal tunnel syndrome. A critical analysis of each of the CTDs shall be made.

### **Tendonitis**

This is the inflammation of the tendons which attach muscle to the bones and allow movement of the bones. This condition occurs with continued use of the constant tensioning of the muscles which pull the tendons. Tendonitis usually occur in the wrist, elbow and shoulders. It can also occur in the knees and ankles. Putz-Anderson (1988) gave the example of construction works that can result in tendonitis which include working with hands above the shoulder such as ceiling works, electrical fitting, blocklaying etc. Force extension, repeated throwing of heavy loads and pulling works among others.

### **Thoracic Outlet Syndrome**

This occurs when the muscular and connective tissue structures of the shoulder and upper arm entrap and compress the blood vessels from the heart and nerves from the spine arm which serve the arm. The effect can be felt as numbness in the fingers and a weakened wrist pulse, this causes the arm to feel like it is "falling asleep" the risk for this syndrome is increased by a number of activities such as working above one's shoulder head, carrying heavy items such as concrete blocks, pulling the shoulders outward/back and up and up and carrying loads while using shoulder straps. Some of the common tradesmen on site affected by this syndrome are the painters, sheet metal workers, welders and truck drivers, (Putz – Anderson, 1988 and National Safety Council, 1993).

### **Tennis Elbow**

Cumulative Trauma Disorder, otherwise known as Lateral Epicondylitis is a painful inflammation of the fore arm tendons that attach to the outer side of the elbow. It is caused by a Jerky throwing motion, strong wrist finger extension, pulling the wrist and fingers away from a curled position. It is often in combination with the

### ***The Coconut***

forearm/wrist twisting. Construction workers involved in repetitive throwing of heavy loads are in high risk of the CTD (OSHA, 1997).

### **Rotator Cuff Tendonitis**

This CTD is the most common shoulder tendon disorder and is usually caused by repeated elevation of the arm above the shoulder. According to Charles and James (1999) the condition may result to what is called “Frozen Shoulder” which is very painful loss of shoulder function. Workers on construction site performing sheet metal work, painting plumbing and drywall installation may have a higher risk of this cumulative trauma disorder.

### **Reynaud’s Syndrome**

This disorder is often called ‘Vibration write finger’ or “Hand arm vibration syndrome”. It is caused by the forceful gripping and/or prolonged use of vibrating tools driven by electrical or pneumatic sources. Blosser (1992) found out that this disorder is extreme among workers handling vibrating tools in cold weather condition. Workers who handle construction equipment such jigs, poker vibrators, vibrating tamping tool, terrazzo tools etc. have very high risk of being victim of this CTD.

### **Golfter’s Elbow of Carpenter’s Elbow**

This CTD is medically called *medial Epicondylitis*. This is the painful inflammation of the inside of the elbow. OSHA (1997) stated that Golfter ‘s Elbow is caused by the repeated rotating of the forearm and bending of the wrist and fingers at the same time. Higher rates or incidence have been found among individuals doing electrical wiring operation. It is also common among other workers who perform repetitive and awkward task and use poorly designed tools.

### **Trigger Finger**

This CTD affect the synovial sheath. With over use, the synovial sheath can become so swollen that the tendons become temporarily locked inside. When a worker attempt to move the finger it will often snap or move in a jerking manner. This type of CTD is often caused by using tools with hard edges or ridged handle and/or repeated bending of the finger while maintaining a forceful grip (OSHA, 1997).

### **Ganglion Cyst**

This CTD another possible response of the body of the overuse of the synovial sheath. In this case the sheath become irritated and filled with fluid (Synovial Fluid) to the point that the sheath swells and becomes a bump under the skin. This often occurs at the wrist. It is caused by blunt force injury or repetitive and forceful gripping or opening of the hand. Construction workers who often pound objects with their hand or who accidentally strike hard objects with their hands fall victims of this disorder.

### **Carpal Tunnel Syndrome**

This disorder derived its name from carpal tunnel which accommodate major nerve called the median nerve and nine tendons in their sheath. The tunnel which is located between the wrist bone and the strong ligaments stabilize the underside of the wrist. The disorder starts if the tendons in their sheaths become irritated through overuse and awkward postures which become swollen and cause narrowing of the carpal tunnel.

The indications of the CTD are pain, swelling, numbness, tingling or burning sensations in the thumb and the three fingers. This, in turn results in loss of finger sensation and grip strength and may cause permanent disability of the fingers. Construction works mostly affected by this syndrome include electrical, caulking windows, brickwork and carpentry trades. All these tasks require bending, twisting and straining of the wrist, hand and fingers.

### **Causes of CTDs**

Accidents and illness in the work place don't just happen, they are always caused. In the same vein, Cumulative Trauma Disorders (CTDs) are caused as result of risk factor encountered on site during construction processes. Although the cause of each of the CTDs was mentioned it is proper to have an overview of the causes. Charles and James (1999), our lined them a follows:-

1. Constantly repeated motions during the process of carrying of construction processes.
2. Use of high level of force during task implementation. For example the use of burnt chisel in concrete work.
3. Unnatural or awkward position as a result of use of tools that can not allow natural body posture.
4. Body position that are held for long periods of time for example electrical wiring of ceilings, and blocklaying at above the shoulder.
5. Compressing of body tissue against hard and sharp corners, like in the case of poorly design tools handles and tight operation space.
6. Whole body vibration, as well as hand and arm vibration such as in the use of jigs and power trowels.
7. Mental stress due to time pressure, low control of job processes, and problems with social support on the job.
8. Fatigue due to inadequate recovery times, having frequent breaks are not the normal mode of operation on construction sites.

### **Prevention of Cumulative Trauma Disorders**

The enforcement of the occupational safety and health rules and safe work procedures can go a long way in preventing occupational diseases and disorders. In Nigeria the laws of the Federation Factories Act (CAP 126) has adequate provision to protect workers in workplaces. Part V sections 45-50 of the document presented clear requirements for employers to prevent occupational disease, disorder and accidents.

*The Coconut* The effects of Cumulative Trauma Disorder can be devastating on the victims some fairly simple measures can go a long way to decrease of prevent CTDs. These include:

- i. Use of tools with smooth handles, rounded edges, long handles and the proper diameter.
- ii. Provide adequate insulation to handles of vibrating equipment to reduce the degree of vibration.
- iii. Set up the work area to minimize excessive stretching, bending or other awkward posture.
- iv. Rotate between tasks so that different muscles and body parts are being used.
- v. Decrease repetition rates, reduce force requirement, and reduce awkward posture whenever possible.
- vi. Take regular mini-breaks at least five minutes to allow for some recovery time.
- vii. Take longer breaks shifts to allow for natural healing periods
- viii. Workers should get up, move and stretch whenever stress, or pain is felt (micro-breaks of thirty seconds or one minute)
- ix. The use of gloves which can reduce chilling of the hands. (Charles and James, 1999.p565).

The listed preventive measures as simple as they may appear if not properly considered may result in more workers getting out of job as a result of ill health caused by the Cumulative Trauma Disorder. Therefore, foremen of various trades, supervisors and engineers should pay keen interest in making sure that causes of CTDs are reduced to the barest minimum or even eliminated on our construction sites.

### **Conclusion and Recommendations**

A common safety reminder in the construction industry is that a smart worker is a safe worker. This statement implies that a worker need to engage all his senses when carrying out trade task to ensure his safety, irrespective of non-chalant attitude of the employer because if he is out of job as a result of accident or occupational diseases the employer can only settle him and that is all.

This paper identified some common Cumulative Trauma Disorders which affect the efficiency of workers on site, the causes of the CTDs and the possible prevention. Strategies are provided with hope that this silent killer would occupy the centre stage in the mind of stake-holders in the construction industry so that more effort could be put to prevent CTDs from affecting more skilled workforce on construction sites in Nigeria. In order to reduce this traumatic experience the following recommendations are made:

1. Management of construction firm should from time to time organize enlightenment campaign on accident in workplaces and exceptional diseases with emphasis on CTDs as they are hardly noted and reported. The enlightenment campaign can be achieved through workshops, seminars, posters etc.

*Identification, Causes and Prevention of Cumulative Trauma Disorders (CTDS) in the Construction Industry in Nigeria.* **C. A. John (Ph.D): N. A. Nwankwor & T. J. Tika**

2. Site supervisors, engineers and foremen of various trades on site should be adequately trained to enable them easily identify risk factors that cause, Cumulative Trauma Disorders (CTDs) on site.
3. The health units of construction firms should be well equipped and the staff be given adequate training on prevention and treatment of CTDs on sites.
4. Construction firms should acquire latest tools and care of equipment that have taken ergonomic risk in their design and production to reduce the incidences of CTDs on sites.
5. The Federal Government of Nigeria should empower the authorities concern with enforcement of all safety provisions in factories Act (CAP 126) in all workplaces to reduce causes of workplace diseases Cumulative Trauma Disorder in particular.
6. The National Board for Technical Education (NBTE), the National Universities Commission (NUC) and National Commission for Colleague of Education (NCE). Should introduce occupational safety and Senior Secondary School and Post-Secondary Education with emphasis on Technical and Engineering fields.

## **References**

- Blosser, F. (1992). *Primer on occupational safety and health*. Washington D.C. The Bureau of National Affairs Inc.
- Charles, R.D. & James E.V. (1999) *Hand book of OSHA construction safety and health*. London: Lew is publisher.
- Federal Republic Oil Nigeria (1990). *The Laws of the federation. Factories Act (CAP126)* Abuja
- International Labour Organization (2005). *World day for safety and health at work in Focus on safe work*. [safework@ilo.org](mailto:safework@ilo.org). retrieved on 15<sup>th</sup> February, 2007.
- National Safety Council (1993). *Ergonomics: Practical guide* (2<sup>nd</sup> Ed.) Etasca Illinois
- OSHA (1997). *Training courses in OSHA for institution industry* OSHA Training institute Deplaines, USA.
- Puts-Anderson, V. (1988). *Cumulative trauma disorder: Manual for Muscu – skeletal Diseases of Upper Lumbs*. Texas: Taylor and Francis Inc.