Narrative Review Article: Success signs of CPR in Hospital

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ABSTRACT

The casualty has a normal pulse and spontaneous breathing. Ensuring ineffective resuscitation and inactivity of the heart, lack of blood circulation, inability and resuscitation fatigue in the continuation of work. There is often no bid to announce the end of CPR. The resuscitation team, loaded with the knowledge and awareness of bittersweet experiences, sometimes gives up on continuing CPR due to symptoms. Several factors can lead to cardiopulmonary arrest. Cardiopulmonary arrest does not necessarily occur together, and cardiac arrest may occur first, followed by respiratory arrest. Conversely, if the heart first suffers, it may stop breathing due to blood reaching the respiratory centers and disrupting the function of these centers. If it stops first, the heart will stop because of severe cardiac hypoxia. Normally the P lead II wave has a peak. In left atrial hypertrophy, the P-wave II wavelength is prolonged, lasting equal to or greater than 0.12 seconds. The P-wave is also serrated in lead II and has the pattern M. The most common cause of left atrial enlargement is mitral valve stenosis. For this reason, the wide, serrated P-wave in lead II is called the mitral P-wave. Ischemic heart disease, MI, hypertension, fibrotic degeneration, aortic stenosis due to calcium deposition, hypertensive or congestive cardiomyopathy, hypertrophy, congestive heart disease, following cardiac surgery, left ventricular heart failure. May occur in the absence of heart disease, fibrotic degeneration, ischemic heart disease, MI, hypertension, cardiomyopathy, myocarditis, congenital heart disease, atrial septal defect, fallot tetralogy, acute and massive pulmonary embolism, and renal mass QRS complex time is more than 0.12 seconds (3 small squares).

Introduction

If the stimulus wave cannot pass through the left branch, then the left ventricle is not depolarized in this way [1-3], but the stimulation from the right ventricle reaches the left ventricle through the muscle and stimulates the left ventricle. In order to check the presence or absence of pulse and the need for continuous external corneal massage, the carotid pulse should be checked periodically [4-6]. Also in the presence of a pulse, radial, femoral, and carotid pulses should be touched, respectively [7-9], to estimate blood pressure limits [10-12]. In case of

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abdominal protrusion and gastric distention in order to prevent vomiting and aspiration of gastric material and also reduce diaphragm pressure on the chest and facilitate breathing, gastric air should be emptied [13-15].

Existence of RSR panel in leads V1 and V2.

- ✓ Long QRS complex time more than 0.12 seconds [16].
- ✓ Deep S in leads V5, V6, AVL, I [17].
- ✓ Deviation of the heart axis to the right.
- ✓ The T direction will be the opposite of the QRS direction [18].

Characteristics of right branch block

- ✓ The secondary R wave R is seen in V1.
- ✓ Slurring T-wave at leads V4-V6 and 1 AVL [19].
- ✓ The T-wave tends to be the opposite of the last component of the QRS complex, meaning that the T-wave may be reversed on wall leads V1 to V3 (Figure 1) [20].

Figure 1: RBBB

Changes of left branch block in electrocardiography

- ✓ Existence of a broad complex of about 0.12 seconds or more [21].
- ✓ Existence of form M QRS complex in leads V6, V5, AVL, I [22].
- ✓ Deviation of the heart axis to the left.
- ✓ Existence of QS, RS complex in leads V1 to V4 [23]. This image makes it difficult to diagnose myocardial infarction if the patient has anthroptal and septal infarction [24-26].

Characteristics of the left branch block

- ✓ The QRS complex time is equal to or greater than 0.12 seconds (3 small squares) [27].
- ✓ There is no secondary R wave in V1.
- ✓ There is no Q wave in the side leads (AVL, I, V5 and V6) [28].
- ✓ There are secondary variations of the ST-T component [29].
- ✓ ST segment changes are in the opposite direction to the dominant (end) part of the QRS complex [30].
- ✓ The changes in the T wave are in the same direction as the changes in the ST segment [31].

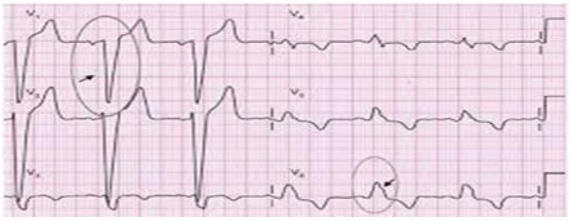

Figure 2: LBBB

Hemi blocks

Left posterior hemi-block

Diagnosis of left posterior hemi-block cannot be confirmed by a single lead alone. A previous ECG and clinical information are needed to diagnose this disorder [32-35]. Left posterior hemi-block is usually associated with significant left ventricular disease [36].

Characteristics of left posterior hemi-block

- ✓ Significant deviation of the heart axis to the right (between 90 and 120 degrees).
- ✓ Presence of primary negative vector (Q wave) in lower leads (aVF, III, II) and small R in leads me, AVL
- ✓ Lack of other causes of right-axis deviation [37-39].
- ✓ Partial flattening of the QRS complex, but usually QRS time is normal.
- ✓ Secondary T-wave changes in the lower leads (reversal).

Characteristics of left anterior hemi-block

- ✓ There is a marked deviation of the heart axis to the left (less than 30 degrees).
- ✓ The primary r wave is seen in all lower leads (AVF, III, and II).
- ✓ There are no other causes of left axis deviation [40-42].
- ✓ Existence of obvious Q wave in AVL and I leads.
- ✓ Slurring the end r wave in AVL and AVR.
- ✓ Lack of primary Q wave in leads V5, V6.
- ✓ Smooth or reverse T wave at AVL and I leads.

Hypertrophies

Left ventricular hypertrophy

Left ventricular hypertrophy is an enlargement of the left ventricular muscle of the heart that results from increased blood pressure or aortic stenosis. Left ventricular hypertrophy is a relatively common genetic disease (one percent of the population) [43-45]. Genetic disorders in patients with this disease lead to an increase in the thickness of the heart muscle, which is characteristic and is detected in echocardiography [46-48].

Signs and symptoms of left ventricular hypertrophy

- ✓ Symptoms of heart failure include fatigue, shortness of breath.
- ✓ History of sudden death in close relatives.
- ✓ Recording of ventricular arrhythmias in Holter monitoring [49].
- ✓ History of syncope attacks in the affected person.
- ✓ Very severe increase in the thickness of the heart muscle [50-52].
- ✓ Hypotension during exercise testing.

Sokolow-Lyon criterion (Sokolow-Lyon)

- ✓ The sum of the depth of the S-wave at lead V1 and the height of the R-wave at lead V5 or V6 is equal to 35 mm or the R-wave at leads V5 or V6 greater than 26 mm (more sensitive) [53].
- ✓ Each of the pericardial leads is greater than 45 mm.
- ✓ R wave aVL lead greater than 11 mm.
- ✓ R-wave I lead greater than 12 mm [54].
- ✓ R wave leads aVF more than 20 mm.

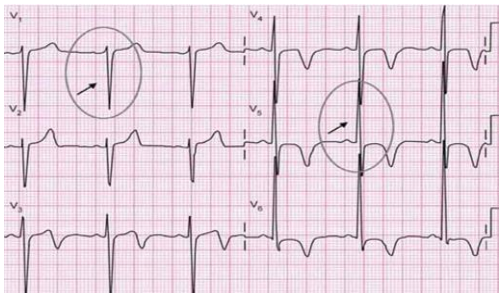

Figure 3: LVH

Left ventricular hypertrophy (LVH) indicates enlargement of the left ventricle and indicates that there are more masses and cells in the left ventricle [55-57]. Therefore, the larger action potential causes this problem, which in turn leads to a larger vector and an ECG amplitude. This is especially true of pericardial leads because they are closer to the heart wall [58].

Causes of left ventricular hypertrophy

- ✓ Systemic hypertension.
- ✓ Hypertrophic cardiomyopathy.
- ✓ Aortic coarctation [59].
- ✓ Aortic stenosis [60].

Clinical features of left ventricular hypertrophy

- ✓ They have an epoxy beat.

Left ventricular hypertrophy strain pattern

The strain pattern is the configuration of the ST segment and the T wave, which is caused by the repolarization anomalies found in RVH or LVH.

Criterion of left ventricular hypertrophy

- ✓ In leads V4, V5 and V6, the depression of the ST segment is seen with its

downward convexity and its symmetrical inverted T wave [61-63].

- ✓ In leads V1, V2, V3, reciprocal changes similar to the rise of the ST segment with upward convexity and its symmetrical prominent T are seen [64-66].

Note: The rise of the ST piece can be between 1-3 mm in V2 and V3 leads. The deeper or longer the resulting wave, the greater the strain [67].

Right ventricular hypertrophy

Criterion of right ventricular hypertrophy

- ✓ The R wave of lead V1 divided by the S wave of lead V1 must be greater than 1 (more specific sign) [68-70].
- ✓ The R-wave of lead V1 plus the S-wave of lead V5 or V6 is equal to 11 mm (Sokolov, Lyon criterion) [71-73].
- ✓ The R-wave of the aVR lead must be greater than 5 mm.
- ✓ Wave R led V1 equal to 7 mm.
- ✓ S-wave V1 equals 2 mm [74-76].

Clinical features of right ventricular hypertrophy

Left supraorbital indentation and epigastric pulse [77].

Causes of right ventricular hypertrophy

- ✓ Chronic corpulmonary.
- ✓ Pulmonary hypertension.
- ✓ Pulmonary stenosis [78-80].
- ✓ Tetralogy of Fallot.

Right ventricular strain pattern

- ✓ Criteria in leads V1 and V2:

Convex downward of the sunken ST piece.

Inverted symmetric T wave.

Because the P-wave represents depolarization and contraction of both atria, P-wave examination is used for atrial hypertrophy [81-83]. The V1 derivative is located directly on the atria. Therefore, the best derivation to see atrial hypertrophy on the EKG is the V1 derivation, because it is only in V1 that left atrial depolarization is distinguished from right atrial depolarization, and therefore in V1 the P-wave is biphasic [84-86]. The positive part is the sign of the right atrium axis and the negative part is the sign of the left atrium axis [87-89]. Now, if the positive part becomes clearer, it is a sign of right atrial hypertrophy, and if the negative part becomes clearer, it is a sign of left atrial hypertrophy [90-92]. Lead II is also a good lead for seeing P-wave changes. In this lead, the P wave has only one peak, which has a special shape at the size of the right or left atrium [93].

Right atrial hypertrophy

In right atrial hypertrophy, there is a long P-wave (equal to or greater than 2.5 mm) in lead II. Because the most common cause of right atrial enlargement is pulmonary hypertension, this long p is called the pulmonary p [94-96].

Characteristics of right atrial hypertrophy on EKG

- ✓ Large and clear first part (positive) of P wave in lead V1.
- ✓ There is a long P wave and a peak (equal to or greater than 2.5 mm) in lead II.

Left atrial hypertrophy

Characteristics of left atrial hypertrophy in EKG

- ✓ The magnitude and sharpness of the second (negative) part of the P wave in lead V1 [97].
- ✓ Toothed and P-wavelength (equal to or greater than 0.12 seconds) in the lead.

The most common causes of sudden death

Heart attack and cardiac arrest, accidents, chest trauma, trauma, suffocation in water, gas asphyxiation due to fire, chemical injuries, severe electric shock and burns, drug poisoning, suicide and other suicides, extensive pulmonary embolism [98-100].

Definition of clinical death

At time zero, when a person suffers from cardiopulmonary arrest, lacks pulse and respiration, and has no vital signs, he or she is said to have died clinically. Damage is often reversible at this stage [101-103]. When resuscitation is delayed for some reason, lacking oxygen and circulating for more than 4-6 minutes, irreversible damage to the brain leads to physiological death [104-106].

Definition of physiological death

It is a cardiopulmonary arrest that is associated with irreversible brain damage. Successful CPR usually takes from zero to 4 to 6 minutes, this time is called the golden time [107].

BLS steps

A) Assess the level of consciousness;
B) Contact the resuscitation group;
C) Giving the patient a suitable position;
D) Open the airway [108];
E) Establish breathing and establish blood circulation;
F) Reassessment of the injured person;
G) CPR report submission [109];

Assessing the level of consciousness of the injured: In order to assess the level of consciousness of the client, the following measures should be taken:

- ✓ Gently shake the injured shoulder if the spine and neck are not injured.
- ✓ Addressing and asking the injured person aloud [110].
- ✓ Asking for help is asking for help out loud or, if possible, accessing the phone, calling the emergency code or center. In all victims of hypoxic cardiac arrest (such as drowning, overuse of medication) CPR should be started for 2 minutes or 5 cycles of massage and artificial respiration (each cycle includes 30 massages) before leaving the patient to announce a code or request help. And 2 breaths).
- ✓ Giving the injured patient a proper position, place the back on a flat, firm surface.
- ✓ Establishing blood circulation, which includes checking the blood circulation and function of the injured heart, in the anesthetized person, the most appropriate way to check blood circulation is to control the carotid pulse.
- ✓ 6) Airway opening includes opening, clearing and maintaining the airway.

Note: When repairing the patient's spleen, pay attention to the stability of the spine and neck vertebrae.

Carotid pulse control

Place your left hand on the injured person's forehead, push his head back, and place the index and middle fingers of the right hand next to the thyroid cartilage or on the larynx in the middle of the neck, and move the fingers outward, i.e. inward. Examine the cavity between the trachea and the lateral muscles of the neck for 10 seconds for a carotid pulse, and if there is neck trauma, you can use the femoral, radial and brachial pulses, respectively. In the absence of a pulse, massage 2, and if unable to open the airway using the chin lift maneuver, use the motor to pull the head back and lift the chin, and the ratio of massage to breathing in solitary resuscitation in adults, 30 massages for 2 breaths and valves 1-14 years and infants under one year in single resuscitation 2, 30 and double resuscitation 2, 15 and at the time of presentation of breathing, the chest should not be squeezed, but in intubated patients, should not Massage should be discontinued at the time of delivery and there should be no coordination between delivery time and chest compression, and CPR should preferably be performed by two lifeguards [111]. One is in charge of cardiac massage and the other keeps his head position

and keeps the airway ventilated. In order to maintain the quality and quantity of massage and artificial respiration, rescuers should change their role every 2 minutes, and this should be done with minimal interruption in the CPR process. Chest pressure in adults should be firm, lowering the sternum by 2.5 to 2.5 inches (54 cm) and in 18-year-olds by one-third to one-half the diameter of the chest, with a massage rate of about 100 minutes. Check every 30 to 2 pulses after every five CPR cycles. Non-professional resuscitators following the delivery of two breaths should begin massage, but professional resuscitators following the delivery of the first two breaths should feel the carotid pulse for a heart rate (maximum 10 seconds) and, in the absence of a carotid pulse, begin cardiac massage. During CPR, if the AED is reached or the ACLS team arrives, the heart rhythm should be checked and shock in shock-adjustable rhythms (VT / VF) should be performed, and after the CPR operation, all actions performed should be detailed. Be recorded and reported. The following four maneuvers are used to open the airway:

Maneuver of bending the head back and lifting the neck

Procedure: The resuscitator should place one hand under the neck and the other hand on the patient's forehead, bending the head backwards. This maneuver causes the tongue to pull back from the back wall of the throat, opening the mouth and keeping the airway open.

Note: This maneuver can be performed in the absence of cervical spine trauma.

Maneuvering pulling the head back and lifting the chin

Procedure: The resuscitator should place his left hand on the casualty's forehead and pull his head back. Then, with the help of two fingers of the right hand, raise the chin.

Note: This maneuver can also be performed in the absence of injury or the possibility of cervical spine trauma.

Establish breathing

This step involves examining the injured person's breathing status and oxygenation. Respiratory status is checked to ensure the presence or absence of ventilation.

Note: The start of artificial respiration is done by maintaining the correct position of the airway and with two breaths [112].

Note: Observe the up and down chest of the casualty with your eyes and pay attention to the sound of breathing air passing through your ears and feel the air flow and give him enough volume and proportionate to the capacity of the injured lung and observe the tail time. As soon as you start breathing, start with 100% high oxygen content and allow the exhaled air to escape completely between the tails. If ventilation and breathing are not possible despite efforts, cardiac massage should be started. Mouth-to-mouth In order to perform mouth-to-mouth breathing, you must perform the following steps in order: Place the adhesive on the casualty's forehead with the thumb and forefinger free, then bend the back of the head with the right hand under the neck or under the lower jaw. Close the nostrils with two fingers. Place your mouth around the casualty's mouth so that air escapes from around the lips when blowing. Give him two full, calm breaths that fit the injured person. Note that the brewing time lasts about one second. At the end of the inhale, place your fingers on your nose to exhale [113].

Note: The most important criterion for proper ventilation is the rise and fall of the chest. Extreme ventilation that is too hot or too deep can be harmful. The number of breaths in adults is one breath every 5-6 seconds and in children (1-14 years old) and noradans (less than one year) one breathe every 3-5 seconds and be sure to do mouth-to-mouth and do these maneuvers

should ensure that the neck vertebrae are healthy. If you are not able to provide two effective breaths, you should try to exhale again if you see a foreign object.

Note: After starting spontaneous breathing and controlling the pulse and making sure that the patient is in a stable condition, you can put the injured person in a recovery position and leave him for a few moments to inform those around him with the emergency team.

If you have a compact mask, you can do the following

Open the patient's airway by the above methods. Fix the mask on the injured face and nose. Press the mask on the patient's face so that the patient's mouth is slightly open and above the patient's head with the thumb and other fingers. Insert the mask into the patient's lungs through the interface tube. The mask has a one-way valve, the patient exhales and drains from another outlet.

Note: One of the important complications of artificial respiration is the dilation of the stomach by the inhaled air, which can cause vomiting and aspiration. In the event of this complication, turn the patient to the side, with the back to the rescuer, and gently apply pressure to the epigastric region to drain gas and gastric contents. Then clean the patient's mouth as much as possible and continue artificial respiration.

Reassessing the condition of the injured

Reassessment of the casualty less than 5 minutes after the start of the CPR operation, the patient's general condition should be assessed. These assessments include the following:

Airway and ventilation review: Make sure the patient's airway is still open and well ventilated. Bilateral hearing of pulmonary sounds and attention to the corneal movements of the chest when blowing into the lungs can be helpful. Notice if the patient's breathing has returned spontaneously. If the patient returns to breathing, make sure that the airway remains open [114].

Conclusion

Cardiopulmonary resuscitation is a series of actions performed by conscious and present individuals on the scene to restore the function of two vital organs, the heart and lungs, and to prevent brain damage and death, which is the ultimate goal of resuscitation. A report of all CPR operations and repeated assessments of the casualty must be accompanied by an accurate record. In addition, other possible injuries as well as the cause of cardiopulmonary arrest should be recorded. Pupil stenosis, improvement of skin and nail bed color and skin temperature, heart rate, return of voluntary breathing and voluntary and purposeful movements of limbs, return of swallowing reflex, necessary follow-ups after successful CPR and ventilation control, maintenance of normal body temperature, Connect the patient to pulse oximetry and control and monitor vital signs and control ABG - BS - Na - K - Hb and perform CXR in terms of endotracheal tube control and possible complications.

Pulmonary aspiration and separation of the ribs from the sternum and rib fractures include rupture of the liver and pneumothorax, hemothorax, rupture of the lung, and cardiac tamponade.

References

[1] M Nabiuni et al, Biomarkers in the diagnosis of superficial head injury, Eurasian journal of chemical, medical and petroleum research, **2022**; 1(5):99-110 [Crossref], [Google Scholar], [Publisher]

[2] M Nabiuni et al, Eurasian journal of chemical ,medical and petroleum research, **2022**, 1(5):99-110 [Crossref], [Google Scholar], [Publisher]

[3] M Nabiuni et al, Interdisciplinary Journal of Virtual Learning in Medical

Sciences; **2023**, 14(4): 294-300 [Crossref], [Google Scholar], [Publisher]
[4] M Nabiuni et al, Iran J Neurosurg, **2023**; 9 : 19 [Crossref], [Google Scholar], [Publisher]
[5] M Nabiuni et al, Iranian Journal of Neurosurgery; **2023**,9: 15-15 [Crossref], [Google Scholar], [Publisher]
[6] M Nabiuni et al, Iranian Journal of Neurosurgery; **2023**; 9:E19. [Crossref], [Google Scholar], [Publisher]
[7] M Nabiuni et al, Neurosurgery Quarterly journal; **2014**, 24(2): 94-97 [Google Scholar], [Publisher]
[8] M Nabiuni et al, Interdisciplinary journal of virtual learning in medical sciences, **2023**, 14(4): 294-300 [Crossref], [Google Scholar], [Publisher]
[9] M Nabiuni et al., Eurasian journal of chemical,medical and petroleum Research (EJCMPR); **2022**; 1(5):99-110 [Crossref], [Google Scholar], [Publisher]
[10] M Nabiuni et al., Interdisciplinary journal of virtual learning in medical sciences, **2023**, 14(3): 206-215 [Crossref], [Google Scholar], [Publisher]
[11] F Mirakhori, M Moafi, M Milanifard, H Tahernia, Journal of Pharmaceutical Negative Results, **2022**; 1889-1907 [Crossref], [Google Scholar], [Publisher]
[12] H Tahernia, F Esnaasharieh, H Amani, M Milanifard, F Mirakhori, Journal of Pharmaceutical Negative Results, **2022**; 1908-1921[Google Scholar], [Publisher]
[13] A Khalaji, et al., Advances in Monoclonal Antibody Therapies for Triple-Negative Breast Cancer: Immunotherapeutic and Targeted Strategies. Current Molecular Medicine. **2024**.[Google Scholar], [Publisher]
[14] A Khalaji, et al., Don't eat me/eat me signals as a novel strategy in cancer immunotherapy. Heliyon. **2023;** 1;9(10). [Google Scholar], [Publisher], [Crossref]
[15] S Moharamipour, et al., Hydroelectric actuator for 3-dimensional analysis of electrophoretic and dielectrophoretic behavior of cancer cells; suitable in diagnosis and invasion studies. Biomaterials Advances. **2023**; 1;151:213476.[Google Scholar], [Publisher], [Crossref]
[16] A Khalaji, et al., A bioinformatics-based study on the Cisplatin-resistant lung cancer cells; what are the orchestrators of this phenom?. Gene. **2022;** 5;834:146668.[Google Scholar], [Publisher], [Crossref]
[17] F Vatankhah, et al., Immune checkpoints and their promising prospect in cholangiocarcinoma treatment in combination with other therapeutic approaches. International Immunopharmacology. **2023**; 1;114: 109526.[Google Scholar], [Publisher], [Crossref]
[18] R Ranjbar, et al., Prevalence, identification of virulence factors, O-serogroups and antibiotic resistance properties of Shiga-toxin producing Escherichia coli strains isolated from raw milk and traditional dairy products. Antimicrobial Resistance & Infection Control. **2018**; 7(1):1-1. [Google Scholar], [Publisher], [Crossref]
[19] E Yahaghi, et al., Helicobacter pylori in vegetables and salads: genotyping and antimicrobial resistance properties. BioMed Research International. **2014**; 12;2014: 757941.[Google Scholar], [Publisher], [Crossref]
[20] A Hasanpour Dehkordi, et al., One-year prevalence of antimicrobial susceptibility pattern of methicillin-resistant Staphylococcus aureus recovered from raw meat. Tropical Biomedicine. **2017**;34(2):396-404. [Google Scholar], [Publisher]
[21] Z Mashak, et al., Phenotypic and genotypic assessment of antibiotic resistance and genotyping of vacA, cagA, iceA, oipA, cagE, and babA2 alleles of Helicobacter pylori bacteria isolated from raw meat. Infection and Drug Resistance.

2020; 29:257-72. [Google Scholar], [Publisher], [Crossref]
[22] R Ranjbar, et al., Methicillin-resistant Staphylococcus aureus isolates from Iranian restaurant food samples: Panton-Valentine Leukocidin, SCCmec phenotypes and antimicrobial resistance. Tropical Journal of Pharmaceutical Research. **2017;** 7;16(8):1939-49.[Google Scholar], [Publisher], [Crossref]
[23] R Ranjbar, Shahreza MH. Prevalence, antibiotic-resistance properties and enterotoxin gene profile of Bacillus cereus strains isolated from milk-based baby foods. Tropical Journal of Pharmaceutical Research. **2017;** 7;16(8):1931-7.[Google Scholar], [Publisher], [Crossref]
[24] S Torkan, MH Shahreza. VacA, CagA, IceA and OipA genotype status of Helicobacter pylori isolated from biopsy samples from Iranian dogs. Tropical Journal of Pharmaceutical Research. **2016;** 4;15(2):377-84. [Google Scholar], [Publisher], [Crossref]
[25] MH Shahreza, et al., Shiga-toxigenic Escherichia coli in ready-to-eat food staffs: Prevalence and distribution of putative virulence factors. Microbiology Research. **2017;** 22;8(2):7244. [Google Scholar], [Publisher], [Crossref]
[26] L Khaji, MH Shahreza. SCCmec types in methicillin-resistant Staphylococcus aureus strains of various types of milk. Electronic Journal of Biology. **2016**; 13:1. [Google Scholar], [Publisher]
[27] MS Shahreza, Ready To Eat Food Samples As Reservoirs Of Shiga Toxigenic Escherichia Coli. Journal of Pharmaceutical Negative Results. **2022;** 31:9761-6. [Google Scholar], [Publisher], [Crossref]
[28] MS Shahreza, & H Afshari,. Ribotyping and assessment of toxigenic genes of clostridium difficile strains isolated from raw meat. International Journal of Health Sciences, **2022**; 6(S6), 4853–4863. [Google Scholar], [Publisher], [Crossref]
[29] MHS Shahreza, A Soltani, Genotyping and antibiotic resistance of methicillin-resistant staphylococcus aureus strains isolated from raw and frozen meat samples and assessment of the antimicrobial effects of origanum vulgare against MRSA isolates. International Journal of Health Sciences, **2022;**, 6(S6), 4840–4852. [Google Scholar], [Publisher], [Crossref]
[30] MS Shahreza, et al., Genotyping of Campylobacter jejuni isolates from raw meat of animal species. Academic Journal of Health Sciencies: Medicina balear. **2022**;47(4):52-7. [Google Scholar], [Publisher], [Crossref]
[31] MS Shahreza, et al., Virulence characters and oligotyping of Pseudomonas aeruginosa isolated from meat and assessment of the antimicrobial effects of Zataria multiflora against isolates. Academic Journal of Health Sciencies: Medicina Balear. **2022;** 37(4): 11-16. [Google Scholar], [Publisher], [Crossref]
[32] K Liu, et al., Preparation of Paclitaxel Nanocrystals Coated with Folic Acid-Modified Phospholipids Based on Preoperative Chemotherapy for Gastric Cancer. Journal of Biomedical Nanotechnology. **2024**; 1;20(1):35-41. [Google Scholar], [Publisher], [Crossref]
[33] A Baghersad, et al., Immunochemical Characterization of Salix alba (S. alba) Pollen Allergens and Evaluation of the Cross-Reactivity Pattern with Common Allergenic Pollen Grains. International Immunopharmacology. **2023;** 1;124:110953.[Google Scholar], [Publisher], [Crossref]
[34] M dousti , et al., The potential role of protein disulfide isomerases (PDIs) during parasitic infections: a focus on Leishmania spp.Pathogens and Disease, **2023;** 81, 87, [Google Scholar], [Publisher], [Crossref]
[35] S Karbasizade, et al., Comparison of therapeutic effects of statins and Aloe vera mouthwash on chemotherapy induced oral mucositis. International journal of

physiology, pathophysiology and pharmacology. **2021**;13(4):110, [Google Scholar], [Publisher], [Crossref]
[36] M Azizian, et al., Predictive value of number and volume of demyelinating plaques in treatment response in patients with multiple sclerosis treated with INF-B. American Journal of Neurodegenerative Disease. **2022**;11(1):10., [Google Scholar], [Publisher]
[37] PM Sadeghi, et al., Short term results of stapled versus conventional hemorrhoidectomy within 1 year follow-up. International Journal of Burns and Trauma. **2021**;11(1):69. [Google Scholar], [Publisher]
[38] P Yavari, et al., Comparison of opponensplasty techniques in isolated low median nerve palsy. International Journal of Burns and Trauma. **2020**;10(5):263. [Google Scholar], [Publisher]
[39] F Siadat, et al., The effects of periodontal treatment on pregnancy outcomes: A systematic review of clinical trial studies. Res Dent Sci. **2022**; 10;19(3):260-71 , [Google Scholar], [Publisher]
[40] M Bahrami, et al., Correlations and diagnostic tools for metabolic syndrome (MetS) and chronic obstructive pulmonary disease (COPD) International Journal of Physiology, Pathophysiology and Pharmacology, **2022**;14,6 ,311[Google Scholar], [Publisher]
[41] N Ghasemi Darestani , et al., New Treatments (MSC) in Immune Disorders Like Cancers and Covid Infection: Cancer and Virus New Treatment (MSC), New Treatments (MSC) in Immune Disorders Like Cancers and Covid Infection: Cancer and Virus New Treatment (MSC) , Asian Pacific Journal of Cancer Biology, **2024**; 9 (2), 257-261[Google Scholar], [Publisher], [Crossref]
[42] A Babak et al., Effects of mindfulness-based stress reduction on blood pressure, mental health, and quality of life in hypertensive adult women: a randomized clinical trial study ,The Journal of Tehran University Heart Center, **2022**; 17 (3), 127[Google Scholar], [Publisher]
[43] BA Kiasari, et al., Combination therapy with nivolumab (anti-PD-1 monoclonal antibody): A new era in tumor immunotherapy. International Immunopharmacology. **2022;** 1;113:109365,[Google Scholar], [Publisher], [Crossref]
[44] N Ghasemi Darestani, et al., Association of Polyunsaturated Fatty Acid Intake on Inflammatory Gene Expression and Multiple Sclerosis: A Systematic Review and Meta-Analysis. Nutrients. **2022**; 2;14(21):4627.[Google Scholar], [Publisher], [Crossref]
[45] H Mahmoudi , et al., In vitro delivery of metformin-loaded mesoporous silica nanoparticles for delayed senescence and stemness preservation of adipose-derived stem cells.Journal of Drug Delivery Science and Technology .Volume 87, September **2023**;104769 [Google Scholar], [Publisher], [Crossref]
[46] N Nikrad, et al., Dietary pro-oxidant score (POS) and cardio-metabolic panel among obese individuals: a cross-sectional study , BMC Endocrine Disorders, **2023**; 23,144 [Google Scholar], [Publisher], [Crossref]
[47] HB Harchegani, H Moghaddasi. Designing a Hybrid Method of Artificial Neural Network and Particle Swarm Optimization to Diagnosis Polyps from Colorectal CT Images. International Journal of Preventive Medicine. **2024**; 1;15:4.[Google Scholar], [Publisher], [Crossref]
[48] M Beigi, et al., Experimental and numerical analysis of thermodynamic performance of microwave dryer of onion ,Journal of Food Process Engineering , **2022;** 45 (9), e14116, [Google Scholar], [Publisher], [Crossref]

[49] M Beigi, et al., Forecasting of power output of a PVPS based on meteorological data using RNN approaches, Sustainability, **2022**; 14 (5), 3104 [Google Scholar], [Publisher], [Crossref]
[50] S Abbassi, et al., Nasopalatine duct cyst: A case report. Jundishapur Scientific Medical Journal. **2015**; 14(5): 606-614. [Google Scholar], [Publisher], [Crossref]
[51] A Dabbaghi, et al., Efficacy of image processing filters in the detection of proximal caries in digital bitewing radiograph. Jundishapur Scientific Medical Journal. **2015**; 14(2): 170-180. [Google Scholar], [Publisher]
[52] M Yazdizadeh, et al., Clinical Comparison of the accuracy of root canal length determination in permanent teeth by means of Root ZX electronic apex locator, tactile perception and conventional . Jundishapur Scientific Medical Journal. **2014**; 13(2): 181-190. [Google Scholar], [Publisher], [Crossref]
[53] M Shooriabi, et al., Evaluation of Glycemic Control and its Relationship with Dry Mouth in Patients with Diabetes Mellitus Referred to Ahvaz Dental School. Jundishapur Scientific Medical Journal. **2014**; ; 89-96 [Google Scholar], [Publisher]
[54] A Dabbaghi, et al., Efficacy of Different Image Processing Filters for the Detection of Proximal Recurrent Caries in Digital Bitewing Radiographs. Jundishapur Scientific Medical Journal. **2015**; 14(2): 157-168. [Google Scholar], [Publisher],
[55] S S Shooshtari, et al., Evaluation of the Diagnostic Accuracy of Indirect Conventional and Inverted Processing Digital (PSP) Radiograph Images in Periapical Lesions. Jundishapur Scientific Medical Journal. **2015**; 14(3): 263-272. [Google Scholar], [Publisher]
[56] S Haghnegahdar, et al., Evaluation of Salivary Melatonin in Patients with Oral Lichen Planus Referring to Dentistry Faculty of Jundishapur Ahvaz University at 2011-2012. Jundishapur Scientific Medical Journal. **2015**; 14(5): 563-571. [Google Scholar], [Publisher]
[57] A Feiz, et al., Survey of Selected Radiography Techniques used by Ahvaz Dentists in Implant Treatment. Jundishapur Scientific Medical Journal. **2015**; 14(4): 404-410. [Google Scholar], [Publisher]
[58] N Shams, et al., Effects of Digital Image Processing Filters on Detection of Lateral Cephalometric Landmarks. Jundishapur Scientific Medical Journal. **2015**; 14(3): 354-366. [Google Scholar], [Publisher]
[59] A Biravand , et al., Comparison of Amount of Microleakage from Core Composite Following Incremental and Bulk Composite Build-up Techniques using Clearfil Photo Core-Light Cure. Jundishapur Scientific Medical Journal. **2015**; 14(4): 411. [Google Scholar], [Publisher]
[60] S Sharifi Shooshtari, et al., Evaluation and Comparison of the Diagnostic Accuracy of Indirect Digital Radiography (PSP) and Conventional Radiography in Periapical Lesions. Jundishapur Sci Med J. **2015**; 14(3): 333-341. [Google Scholar], [Publisher]
[61] S Abbassi , et al.,Detection of missing teeth in bitewing images using image processing (Persian/Farsi). National Electronic Conference on Advances in Basic Sciences and Engineering – Ardabil (Iran). **2014**. [Google Scholar], [Publisher]
[62] S Abbassi , et al., Separation of teeth in bitewing images using image processing (Persian/Farsi). National Electronic Conference on Advances in Basic Sciences and Engineering – Ardabil (Iran). **2014** [Google Scholar], [Publisher], [Crossref]
[63] S Abbassi et al.,Separation of tooth crown from root in bitewing images using image processing (Persian/Farsi). The 2nd National Conference of New Technologies in Electrical & Electronics Engineering – Fasa (Iran). **2014** [Google Scholar], [Publisher], [Crossref]
[64] S Abbassi, et al., Separation of teeth from bone in bitewing images using image

processing (Persian/Farsi). The 2nd National Conference of New Technologies in Electrical & Electronics Engineering – Fasa (Iran). **2014** [Google Scholar], [Publisher], [Crossref]
[65] S Abaci Mahmood Jahangirnezhad, et al., Immunohistochemical Analysis of p63 Marker Expression in Pleomorphic Adenoma and Mucoepidermoid Carcinoma of Salivary Gland (Persian/Farsi). Jundishapur Scientific Medical Journal. **2012**; 11(5): 541-548. [Google Scholar], [Publisher], [Crossref]
[66] N Tajbakhsh, et al., Smile management: White esthetic, pink esthetic and facial attractiveness, a review of literature. Open Access Research Journal of Biology and Pharmacy. **2022**; 5(2): 046-050. [Google Scholar], [Publisher], [Crossref]
[67] S Amirfarhangi, et al., Golden proportion and facial esthetic, the harmony and surgical considerations: A review. World Journal of Biology Pharmacy and Health Sciences. **2022**; 11(1): 018-021 [Google Scholar], [Publisher], [Crossref]
[68] A Shahbaz, et al., Bredigite-containing materials for regenerative medicine applications: A rapid review. Journal of Composites and Compounds. **2023**; 5(16): 190-199 [Google Scholar], [Publisher], [Crossref]
[69] M Motaqi, et al., Treadmill Exercise and its Effect on Rehabilitation of Patients after Ischemic strok: A Narrative Study. international Journal of Musculoskeletal pain prevention. **2022**; 7(3): 730-740. [Google Scholar], [Publisher], [Crossref]
[70] M Motaqi, M Afrand, A Ghanjal. Care and Management of Pain in Patients with Musculoskeletal Pain during the Covid-19 Epidemic. International Journal of Musculoskeletal Pain Prevention. **2022**; 7(1): 622-626. [Google Scholar], [Publisher], [Crossref]
[71] M Motaqi, et al., A New Approach to Evaluate of Musculoskeletal Pain. International Journal of Musculoskeletal Pain Prevention. **2022**; 7(4): 781-787. [Google Scholar], [Publisher]
[72] H Ahmady, et al., Utilizing Sertoli cell transplantation as a therapeutic technique for managing neurodegenerative diseases. Archives of Razi Institute. **2023** [Google Scholar], [Publisher]
[73] M Oroei et al. The evaluation of head and neck neoplasm in young and old adults.Social Determinants of Health. **2019**;5(2):117-125 [Google Scholar], [Publisher], [Crossref]
[74] B Fazeli et al. A systematic Review the treatment and diagnose of neurological problem in fat patients adults involved infection with radiological point.International Neuroulogy Journal.**2024**; 28(1):423-433 [Google Scholar], [Publisher]
[75] B Fazeli. A comprehensive overview of Neurological Diseases such as MS,Alzheimers,Guillain Barre and Myasthenia Gravis based on Drug therapy Tips in These patients. **2023**, 164. [Google Scholar], [Publisher], [Crossref]
[76] A Rahat-Dahmardeh, et al., Rhabdomyolysis inCOVID-19Patients: A systematic Review and Meta-Analysis. International Journal of Early Childhood Special Education, **2022**;14(02): 4019-4024. [Google Scholar], [Publisher], [Crossref]
[77] N Behdadian, et al., Treatment Measures in the Face of Viruses, Infectious Diseases and Patients under Plastic Surgery with Impact on Causing Skin Diseases and Its Challenges: The Original Article. Tobacco Regulatory Science. **2022**;8(1) [Google Scholar], [Publisher]
[78] A Ismaili, et al., General Anatomy of Blood Vessels, Nervous System and Respiratory System.**2021**;1: 108 [Google Scholar], [Publisher]
[79] SA A Mousavi Chashmi. A Comprehensive Overview of the Diagnosis and Treatment of Wounds based on the Tips of Various Dressings and Surgical

Methods. **2023**;1(116): 978-620-6-17681-7 [Google Scholar], [Publisher]
[80] F Hosseinzadegan, et al., Cardiovascular Diseases and Relationship with Mortality and Severe COVID-19 in Patients with COVID- 19: A Systematic Review and Meta-Analysis. International Journal of Special Education. **2022**;37(3): 12609-12617 [Google Scholar], [Publisher]
[81] S Keshmiri, et al., Systematic Evaluation of Wound Healing and Easy Intubation Rate in Children with Covid-19 and Hospitalization in Intensive care Units:A Systematic Study. International Journal of Early Childhood Special Education. **2022**;14(1): 2960-2970 [Google Scholar], [Publisher]
[82] Sh Mashaei, et al., Rhabdomyolysis in COVID-19 Infection: A Systematic Review and Meta-Analysis. International Journal of Special Education. **2022**;37(03): 12618-12625 [Google Scholar], [Publisher], [Crossref]
[83] Sh Mashaei, et al., Respiratory Physiotherapy and respiratory therapies in patients with COVID-19: A systematic review and meta-analysis. International Journal of Special Education. **2022**; 37(03): 12655-12662 [Google Scholar], [Publisher]
[84] B Shrestha et al. Role of 18F-FDG PET/CT to evaluate the sffects of chimeric antigen receptor T-cell therapy on lymph node involvement in patients with non-Hodgkin lymphoma.Journal of Nuckear Medicine. **2023**;64(1):1159 [Google Scholar], [Publisher]
[85] M Vakhshoori et al.The impact of platelet-to-lymphocyte ratio on clinical outcomes in heart failure:a systematic review and meta-analysis. **2024**;18 [Google Scholar], [Publisher], [Crossref]
[86] B Shrestha et al. Dual time-point imaging of lymphoma adenopathy using total-body FDG PET/CT. Journal of Nuclear Medicine. **2023**:64(1):1444 [Google Scholar], [Publisher]
[87] N Motamedi et al. PET imaging in pediatric oncology:A Narrative Review.Journal of Nuclear Medicine.**2023**: 64(1):1179 [Google Scholar], [Publisher]
[88] M Shojaei et al. Correlation of serum adiponectin level with metabolic syndrome in postmenopausal women of Bandar Bushehr: a population study. Tebe Jonoob, **2013**;16(5): 276-287 [Google Scholar], [Publisher]
[89] Sh Heshmatollah et al. Effect and safety of alendronate on bone density in patients with chronic kidney disease; a controlled double blind randomized clinical trial. Journal of Parathyroid Disease, **2016**; 4(1): 3-6 [Google Scholar], [Publisher]
[90] Kh Ghasemi et al. Investigation of the prevalence of asymptomatic microscopic hematuria in primary school children of Bushehr and Kharg Island. Tebe Jonoob,**2004**;7(1): 54-60 [Google Scholar], [Publisher], [Crossref]
[91] M Shojaei. Leptin as a Surrogate Marker of Insulin Resistance. **2024**;1: 124 [Google Scholar], [Publisher]
[92] M Shojaei. The Effects of esreradiol on leptin and other factors. Eurasian Journal of Chemical, Medicinal and Petroleum Research., **2024**;3(1): 131-141 [Google Scholar], [Publisher], [Crossref]
[93] M Shojaei. Alternative Systematic Review of Insulin Resistance and the Role of Sex Steroids on Leptin Levels. Eurasian Journal of Chemical, Medicinal and Petroleum Research. **2024**;3(1): 296-306 [Google Scholar], [Publisher], [Crossref]
[94] M Shojaei. A Systematic Review of the Effect and Safety of Alendronate on Bone Density in Patients with Chronic Kidney Disease. Eurasian Journal of Chemical, Medicinal and Petroleum Research. **2024**;3(2): 434-442 [Google Scholar], [Publisher], [Crossref]
[95] M Shojaei. A Systematic Review of the Relationship Between Sex Hormones and Leptin and Insulin Resistance in Men. Eurasian Journal of Chemical, Medicinal

and Petroleum Research. **2024**;3(2): 443-453 [Google Scholar], [Publisher], [Crossref]
[96] M Shojaei. CHAT-GPT and artificial intelligence in Medical Endocrine System and interventions. Eurasian Journal of Chemical, Medicinal and Petroleum Research. **2024**; 3(1): 197-209 [Google Scholar], [Publisher], [Crossref]
[97] B Fazeli, A comprehensive overview of Neurological Diseases, Scholar Press, **2024**, 978-620-5-52216-5 [Google Scholar], [Publisher]
[98] S Sayad et al.comprehensive evaluation of radiation oncology,medical and nursing care treatment in women with breast cancer based on sonographic and radiological points.Pakistan heart journal. **2024**; 57(1) [Google Scholar], [Publisher]
[99] S Sayad et al.comprehensive investigation of radio-oncology in breast cancer patients based on psychological and radiological problem in these.Pakistan heart journal.**2024**; 57(1) [Google Scholar], [Publisher]
[100] H Soltani Nejad Roodabadi et al. The Use of Machine Learning in Supply Chain Management, A Systematic Review. IEOM Society International. 13th Annual International Conference on Industrial Engineering and Operations Management Manila, Philipines; March 7-9, **2023**. [Google Scholar], [Publisher]
[101] H Soltani Nejad Roodabadi et al. Enhancing Operational Efficiency: A Study on Lean Manufacturing Implementation in Small and Medium-sized Enterprises. 8th North America Conference on Industrial Engineering and Operations Management , Houston, United States of AmericaPublisher: IEOM Society International; June 13-15, **2023**. [Publisher], [Crossref]
[102] M Sabouri et al. Prognostic Factors for Fournier's Gangrene; A 10-year Experience in Southeastern Iran. Bull Emerg Trauma journal. Trauma Research Center, Shiraz University of Medical Sciences. **2013**;1(3): 116-122 [Google Scholar], [Publisher]
[103] M Dahmardehei et al. Comparison of Modified Meek Technique with Standard Mesh Method in Patients with Third Degree Burns. World Journal of Plastic Surgery. Iran Society of Plastic, Reconstructive and Aesthetic Surgeons. **2020**; 9(3): 267 [Google Scholar], [Publisher], [Crossref]
[104] M.R Akhoondinasab et al. The comparison of a new durable coronaplasty technique with Norfolk method for glans reconstruction after phalloplasty. World journal of plastic surgery. Iran Society of Plastic, Reconstructive and Aesthetic Surgeons. **2020**; 9(1): 39 [Google Scholar], [Publisher], [Crossref]
[105] M Saboury et al. Underestimated craniomaxillofacial fractures due to firework. World journal of plastic surgery. Iran Society of Plastic, Reconstructive and Aesthetic Surgeons. **2021**;10(3): 46 [Google Scholar], [Publisher], [Crossref]
[106] M Saboury et al. Use of facial artery musculomucosal and turbinate flaps for Rapp Hodgkin syndrome. World Journal of Plastic Surgery. **2022**; 11(2): 153-156 [Google Scholar], [Publisher], [Crossref]
[107] H Alizadeh Otaghvar et al. Medical evaluation of the effectiveness and outcome of regional anesthesia in burn populations to reduce drug use: a systematic review and meta-analysis. Eurasian Chemical Communications. Sami Publishing Company (SPC). **2022**; 4(6): 473-480 [Google Scholar], [Publisher]
[108] S Naderi Gharahgheshlagh et al. Fabricating modified cotton wound dressing via exopolysaccharide-incorporated marine collagen nanofibers. PublisherElsevier. Materials Today Communications. **2024**; 39: 108706 [Google Scholar], [Publisher]
[109] Hadi Kaseb Ghane, et al., High-Power Laser Application for Immediate Implant Placement in Infected Sites: A

Systematic Review, Photo-biomodulation, Photomedicine, and Laser Surgery, **2024**, 41, 12 [Google Scholar], [Publisher], [Crossref]

[110] S Zarinabadi, et al., Investigation Results of Properties of Stripe Coatings in Oil and Gas Pipelines, International Congress of Chemical and Process Engineering, CHISA, **2012** [Google Scholar], [Publisher]

[111] A Samimi, Investigating Corrosion Electrochemical Mechanism in Tuble Lines and Gas Shaft, American Journal of Research Communication (AJRC), **2013** [Google Scholar], [Publisher]

[112]A Hedayati, et al.,Optimize pictures of industrial radiography in corrosion and sediment recognizing in oil or gas transmit pipe lines, International Journal of Chemistry, **2014** 5, 20-29 [Google Scholar]

[113]R Rezaei, A Samimi, Effects of phosphorus and nitrate in wastewater shahinshahr city use for oil refinery, International Journal of Innovation and Applied Studies, **2013** 2 (3), 250-258 [Google Scholar], [Publisher]

[114] H Kaseb Ghane et al., Power Laser Application for Immediate Implant Placement in Infected Sites: A Systematic Review, Photo-biomodulation, Photomedicine, and Laser Surgery, **2024**, 41, 12 [Google Scholar], [Publisher], [Crossref]