



# PROCEEDINGS

## The 4<sup>th</sup> International Conference on Sustainable Innovation (ICoSI) 2020

Cutting Edge Innovations for Sustainable Development Goals

Universitas Muhammadiyah Yogyakarta (Indonesia)

October 13 - 14 2020

<https://icosi.umy.ac.id/>

## Focal Conferences



- ✔ (ICPU) The 2nd International Conference on Pharmaceutical Updates
- ✔ (ICOMS) The 6th International Conference on Management Sciences
- ✔ (ICLAS) The 9th International Conference on Law and Society
- ✔ (ICMHS) The 4th International Conference Medical and Health Sciences
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- ✔ (IConARD) International Conference on Agribusiness and Rural Development
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- ✔ (ICONPO) The 10th International Conference on Public Organization
- ✔ (DREAM) The 5th Dental Research and Exhibition Meeting
- ✔ (ICHA) The 5th International Conference on Hospital Administration
- ✔ (ICOSA) The 3rd International Conference on Sustainable Agriculture





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## Preface by the Chairperson of the 4<sup>th</sup> ICoSI 2020



**Dr. Yeni Rosilawati, S.IP. S.E., MM.**

Assalamu'alaikum Wr. Wb.

All praise is due to Allah, the Almighty, on whom we depend for sustenance and guidance. Prayers and peace be upon our Prophet, Muhammad SAW, his family and all of his companions.

On behalf of the organizing committee, it is my pleasure and privilege to welcome the honourable guests, distinguished keynote & invited speakers, and all the participants.

With the main theme of “Cutting-Edge Innovations on Sustainable Development Goals (SDGs)”, the 4<sup>th</sup> International Conference on Sustainable Innovation (ICoSI) 2020 serves as a forum to facilitate scholars, policy makers, practitioners, and other interested parties at all levels from Indonesia and abroad to present their novel ideas, promote cutting-edge research, and to expand collaboration network. The conference has about 1373 participants participating from more than 8 countries 4 continents all over the world, making this conference a truly international conference in spirit.

This multidisciplinary conference was first held in 2012 and has undertaken various changes and adopted to the current technological trends of our education system. From having this conference with just 175 participants back in 2012 we have come a long way in making the conference a huge success with more than 1373 participants participating in this two-day conference.

Formerly, this conference consisted of only 9 (nine) focal conferences. This year, there are 14 focal conferences from various disciplines, namely: 1) The 2<sup>nd</sup> International Conference on Pharmaceutical Updates (ICPU), 2) The 6<sup>th</sup> International Conference on Management Sciences

(ICoMS), 3) The 9<sup>th</sup> International Conference on Law and Society (ICLAS), 4) The 4<sup>th</sup> International Conference Medical and Health Sciences (ICMHS), 5) The 6<sup>th</sup> International Conference for Accounting and Finance (ICAF), 6) The 2<sup>nd</sup> International Language and Education Conference (ILEC), 7) The 2<sup>nd</sup> International Conference on Nursing (ICONURS), 8) The International Conference on Information Technology, Advanced Mechanical and Electrical Engineering (ICITAMEE), 9) The 2<sup>nd</sup> International Conference of Agribusiness and Rural Development (IConARD), 10) The 10<sup>th</sup> International Conference on Public Organization (ICONPO), 11) The 2<sup>nd</sup> International Symposium on Social Humanities Education and Religious Sciences (ISHERSS), 12) The 5<sup>th</sup> Dental Research and Exhibition Meeting (DREAM), 13) The International Conference on Hospital Administration (ICHA), and 14) The 3<sup>rd</sup> International Conference on Sustainable Agriculture (ICoSA).

Accordingly, We are proud to announce that this year, the 4<sup>th</sup> ICoSI 2020 breaks the Museum Rekor-Dunia Indonesia (MURI) record as the Virtual Multidisciplinary Conference with the Largest Number of Area of Fields in Indonesia

In addition, this year, this conference holds special value since this is the first conference in the history of our university where the entire conference is taking place remotely on a digital platform through the use of advance technologies due to the Covid-19 Pandemic.

I would take this opportunity to express my highest respect to the Rector of Universitas Muhammadiyah Yogyakarta, Dr. Gunawan Budiyanto who gave approval and ensured the maximal support from all the faculty members of Universitas Muhammadiyah Yogyakarta (UMY) that made this event a big success. In addition, my appreciation goes to all the support teams who have provided their valuable support and advice from planning, designing and executing the program.

Let me conclude my speech by encouraging the delegates to participate with an increasing number in all the activities and discussions through the digital platforms for the next two days. I wish everyone a successful, safe, and fruitful conference.

Thank you!

Wassalamu'alaikum Wr. Wb.

Yogyakarta, Indonesia, 14 October 2020





## Welcoming Remarks by the Rector of Universitas Muhammadiyah Yogyakarta



**Assoc. Prof. Dr. Gunawan Budiyanto**

Innovation is the beginning of the development of technology, and technology is a development machine that is expected to provide benefits to humans and provide the smallest possible impact on environmental quality. In the concept of sustainable development, development must improve the quality of human life without causing ecological damage and maintain the carrying capacity of natural resources.

International Conference on Sustainable Innovation (ICoSI) is an international conference which is an annual conference held by the University of Muhammadiyah Yogyakarta (UMY), Indonesia. In 2020 this raises the issue of "Cutting-Edge Innovations on Sustainable Development Goals." Therefore, on behalf of all UMY academics, I would like to congratulate you on joining the conference, hoping that during the Covid-19 Pandemic, we can still provide suggestions and frameworks for achieving sustainable development goals.

# About The 4<sup>th</sup> International Conference on Sustainable Innovation (ICoSI) 2020

## *Cutting Edge Innovations for Sustainable Development Goals*

The 2030 Agenda for Sustainable Development is enacted by the United Nations as a shared blueprint for peace and prosperity for people and the planet, now and into the future. It consists of strategies to improve health and education, reduce inequality, and spur economic growth while also conserving natures by 2030.

This year, however, at the first one-third of its timeline, the SDG Reports shows that the outbreak of COVID-19 did hinder the achievement, or at least decelerate the progress of achieving the 17 goals. In fact, according to the report, “some number of people suffering from food insecurity was on the rise and dramatic levels of inequality persisted in all regions. Change was still not happening at the speed or scale required”, accordingly.

Therefore, in this event of pandemic, the quantity and quality of research, innovation, and more importantly multi-disciplinary collaboration are indispensable. Furthermore, there needs to be clear ends of those works. That is how those research are applicable and benefits directly to the society. That is how those research is incorporated as the drivers of policy making, and used practically in the society. Hence, the stakeholders especially the triple helix of higher education institution, government, and industry must be re-comprehended and supported to reach the common goal of the SGD.

International Conference on Sustainable Innovation (ICoSI) has been essentially attempting to strengthen this regard since its first establishment. One of the goals of ICoSI is to provide primarily a platform where scholars, practitioners, and government could grasp the development and trends of research. Hopefully, meeting these actors altogether would result in stronger collaboration, sophisticated and advantageous research, and brighter ideas for further research. Based on these reasoning, this year, the 4th ICoSI 2020 UMY is themed ‘Cutting-edge Innovations for Sustainable Development Goals’.

Improving from last year conference which brought nine focal conference, this year ICoSI 2020 UMY brings 14 disciplines, from social sciences, natural sciences, and humanities. ICoSI 2020 received as much as 1005 papers. The paper works submitted in ICoSI 2020 UMY will be published in Atlantis Proceedings, IOP Proceedings, National/International Journals, and ICoSI ISBN-indexed Proceedings.

Nevertheless, ICoSI believes that publication is only the beginning of research dissemination. The publications will enhance the chance of the research known by wider audience, and then used, applied, and incorporated at either system, institutional, or personal level of human lives.



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# TRACK ECONOMICS, LAW, EDUCATION, SOCIAL, AND HUMANITIES



# Entrance and Exit Wound in Gunshot Death Cases at Forensic and Medicolegal Installation of Dr. Soetomo Hospital in 2019: Case Study

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## ABSTRACT

**Background:** A gunshot wound is damage caused by the penetration or contact of a bullet with the body. This type of wound is common in Indonesia, with a total of 10 deaths recorded in 2019 from the forensic medicine and medicolegal installation of the Dr. Soetomo hospital. The essential part of post mortem examination is distinguishing between entrance, range, and exit of gunshot wounds. **Objective:** This study aims to determine the strategies used by forensic pathologists to examine the entrance, range, and exit of gunshot wounds. **Methods:** Data was collected from the textbook and result of the visum et repertum in forensic medicine and medicolegal installation of the dr. Soetomo hospital. **Results:** The result showed that there are eight cases of ten cases which the number of entrance gunshot wounds are equal to the number of exit gunshot wounds. These ten cases were classified as a distant range. **Conclusion:** In conclusion, the entrance gunshot wounds differed from the exit with the range determined based on the wounds' pattern.

**Keywords :** gunshot, entrance wound, exit wound, post mortem

## 1. INTRODUCTION

A gunshot wound is caused when a bullet or other projectile is shot into or through the body using a firearm. Damages are dependent on the part of the body hit and are either penetrating or perforating. Wounds are classified as penetrating when the bullet passes extensively through the object [1].

Presently, there is a continuous increase in firearms as weapons of assault outside conflict or police settings, such as in big cities in Indonesia. Firearms are relatively easy to obtain, whether in jurisdictions where their possession and are prohibited or permitted. Based on data from the Surabaya City Police Resort in Poreltabas, 11 deaths recorded in 2019 were attributed to a gunshot wound. Out of this number, 10 of them were referred to the forensic medicine and medicolegal installation of the Dr. Soetomo hospital.

In principle, deaths due to gunshot wounds are similar to trauma. In most cases, treatment starts at the crime scene, before a proper external and internal examination of the body. During death, an autopsy is performed on the body to determine the exact cause of death, with other supporting examinations carried out for proper analysis.

The correct interpretation of gunshot wounds provides valuable information, which aids during investigation and used to determine death. For this reason, it is essential to determine the characteristics of the entrance, exit, and the

range of gunshot wounds.

Therefore, due to the incessant increase in the number of gunshot wounds, it is imperative for Indonesian doctors to possess adequate knowledge of gunshot related-wounds, such as treatment, interpretation, and handling methods to avoid death. For that, the author is interested in writing about gunshot wounds, namely entrance and exit wound gunshot death cases at forensic medicine and medicolegal installation of the Dr. Soetomo hospital in 2019.

## 2. GUNSHOT WOUND

### 2.1. Mechanism of Gunshot Wound

When a gun is shot, 3 different substances are released from the barrel, namely the bullet, unburned gunpowder, and gas. These substances have various effects on the victim's body. For instance, the flame, smoke, gunpowder, muzzle, and bullet burns, tend to form dirty stains, tattoos or stripes, and imprints in the skin, respectively. When the bullet hits the skin and pushes it beyond tenacity, thereby causing tear and wear. The rifle from the barrel of a firearm rotates, causing a round or oval shape, also known as a contusion ring. Furthermore, the bullet is passed through the wound at a diameter greater than the bullet. However, due to the skin's elasticity, after the bullet has passed the body, the skin shrinks thereby, reducing the diameter [2].



## 2.2. The Examination of Gunshot Wound

It is important to examine the medicolegal condition of a gunshot wound. In doing this, doctors need to understand the type of firearms, range of shots, as well as the entry and exit characteristics.

Examination of gunshot wounds to dead victims are as follows:

1. Take a Rontgen photograph to keep track of the wound and the location of the bullet. Unfortunately, this tool is not available in the Forensics section of Indonesia.
2. Examine the gunshot wounds to determine the entrance or exit and take close up photos.
3. It is important to note that a bullet can make two entrance and exit wounds.
4. Clean the wound with cotton soaked in soap to eliminate the black smoke. Then look for tattoos and burns. All of these are important to determine the wound range.
5. Pay attention to the wound track during the autopsy.
6. Look for the bullet carefully and send it to the forensic laboratory [3].

In some circumstances, special examinations of entry wounds such as microscopic, chemical, and X-ray examination are needed [4].

Gunshot wounds occur due to murder, suicide, and accidents. A track from the back to the front or down towards the right temple is not associated with suicide. Therefore, the presence of a weapon tightly gripped in hand (cadaveric spasm), the gunshot wound's location, and the victim's comfortable position is an indication of suicide [5]. A track extending downward or horizontally is attributed to a homicide [6]. However, gunshot wounds can be anywhere, and in most occasions, it is usually more than one. Meanwhile, gunshot wounds associated with accidents are usually due to a firearm's accidental pressure on oneself or other people [5].

## 2.3. Entrance Versus Exit Wounds

The entrance wound is surrounded by abraded skin colored reddish-brown, which is usually obtained from the abrasion edge of the bullet after it penetrates the skin at a temperature of 100°C. The bullet's is dependent on the width and caliber of the weapon. It can be eccentric or concentric, in accordance with its angle to the skin [1]. Furthermore, the presence of an abrasion rim and grease collar around the wound also indicates an entry wound, which is generally smaller and more regular than exit wounds [7].

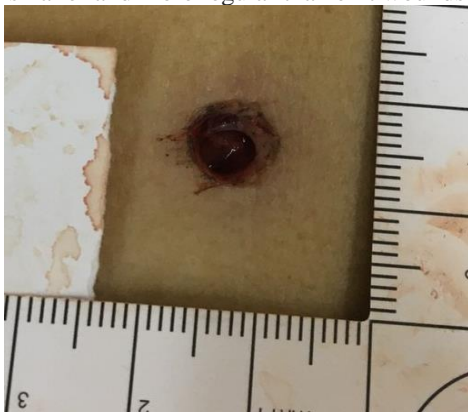


Figure 1. Example of entrance wound

The exit wound is more extensive and irregular compared to the entrance wound due to the bullet's significant surface area. This usually caused by tumbling, deformation, or fragmentation of the projectile. In addition, it does not have an abrasion ring [6], therefore, the more significant and irregular it is due to the stabilized spin, the lesser the bullet's ability to pass through the body. Furthermore, the size and shape of the exit wound, depends on the exit location. For instance on loose skin, it tends to possess small opening, and contrasts with when the skin is stretched over a scalp. The exit wound is usually larger and more irregular [1].

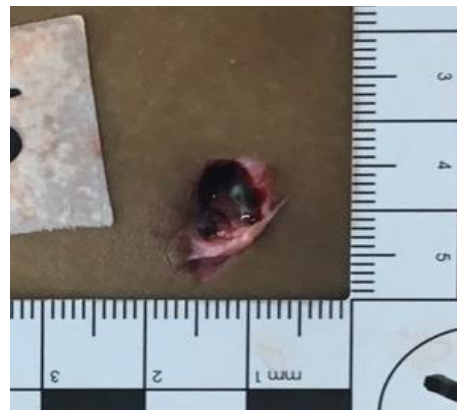


Figure 2. Example of exit wound

Holes in the clothing tend to assist in determining the entrance and exit wounds. Therefore, assuming the fibers around a bullet hole is inverted, it is an entrance wound, and when it is everted, it becomes an exit wound [7].

## 2.4. The Range of Entrance Wounds

Gunshot wounds are categorized into four, in accordance with the range from the muzzle to target, near contact, contact, intermediate, as well as distance. For contact wound, the weapon's muzzle is usually held against the surface of the body at the time of discharge. Meanwhile, the entrance of a near contact wound is surrounded by a wide zone of powder soot, seared with black end skin. In an intermediate-range wound, the gun's muzzle is placed some distance away from the body at the time of discharge. However, the muzzle is close enough which enables the powder grains to tattoo the skin. Tattooing consists of numerous reddish-brown to orange-red punctuate lesions surrounding the wound entrance. This is used to indicate that the individual was alive at the time of the shooting. The distribution surrounding the entrance site is either symmetric or eccentric, depending on the angle. In addition, the marks on the distant gunshot wounds are only those produced by the bullet's mechanical action [1]. The muzzle is usually some few feet away from the skin surface, which tends to prevent tattooing or soot deposition [6].

## 3. GUNSHOT WOUND DEATH CASES AT FORENSIC MEDICINE AND MEDICOLEGAL DR. SOETOMO HOSPITAL IN 2019

The post mortem examination data obtained from the forensic and medicolegal installation of Dr. Soetomo Hospital showed that 10 people died from a gunshot wound in 2019. Table 1 summarizes the cases of gunshot wounds with the characteristics.

Table 1. Frequency Of Entrance And Exit Gunshot Wounds Data At Forensic Medicine And Medicolegal Installation Of The Dr. Soetomo Hospital In 2019

<b>Table Frequency of Entrance and Exit Gunshot Wounds in 2019</b>		
<i>Case</i>	<i>Entrance Wounds</i>	<i>Exit Wounds</i>
Case 1	2	-
Case 2	2	2
Case 3	1	1
Case 4	3	3
Case 5	1	1
Case 6	2	2
Case 7	2	2
Case 8	1	-
Case 9	1	1
Case 10	1	1

Based on table I, There are eight cases of ten cases which the number of entrance gunshot wounds are equal to the number of exit gunshot wounds. This means that the number of exit wounds is not always similar to the number of entrance

wounds. There is a possibility of no exit wound, assuming the tissues absorb the bullet's energy. Some bullets were designed to deform, therefore, all their energy is converted to tissue damage and not exit. These ten cases were classified as a distant range gunshot wound due to the absence of stippling and tattooing.

Therefore, the characteristics for determining the distance of a gunshot wound can be used to examine the entrance and exit gunshot wounds. Furthermore, the location of entrance and exit wounds for all cases was on the chest and back, respectively. A definite cause of death cannot be determined because an autopsy was not performed, and the data was obtained from the post-mortem examination.

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