Case Report

A Case of Secondary Syphilis: Great imitator

DOI: https://doi.org/10.47648/zhswmcj.2022.v0401.08

*Akter M,[1] Hossain S,[2] Khan ZH,[3] Bhuiyan I,[4] Hossain MZ,[5] Ahmed SS,[6]

Abstract

Syphilis is an infectious disease caused by spirochete Treponema pallidum. Due to florid cutaneous & systemic manifestations it was called 'great imitator' often caused confusion with other diseases. We report a case of secondary syphilis presented with non-pruritic, erythematous macules, papules, plaques in a young male; showing high titre of both treponemal & non treponemal test. Single dose of deep intramuscular Benzathine penicillin 12 lac in each buttock was given and patient became symptom free after two weeks. This case highlights common cutaneous manifestations of secondary syphilis which may simulate many diseases and may cause difficulty in diagnosis and treatment. If syphilis remain untreated it causes complications of tertiary or neurosyphilis and social stigmata.

Keywords: Syphilis, Secondary syphilis, Treponema pallidum, Benzathin penicillin.
Received on 06.06.2021; **Accepted on** 09.08.2021

Introduction

Syphilis is a chronic systemic infection transmitted through skin and mucosa, with manifestations in nearly every organ system.[4] The most common and recognizable manifestations are usually cutaneous.[2] . The primary stage classically presents with a typically painless, self-healing ulcer. The lesion develops at the site of inoculation .In untreated individuals, treponemes proliferate in the chancre and are carried via lymphatics to the bloodstream, from which they disseminate throughout the body . The time at which the secondary lesions make their appearance basically depends on two factors: the virulence of the treponeme and the systemic response of the host. [7] Lesions of secondary syphilis are classically called "syphilids" or, when affecting the skin, "syphiloderms.[2]

Here we report a case of non pruritic generalized maculo papular, plaques in a young male.

Case report

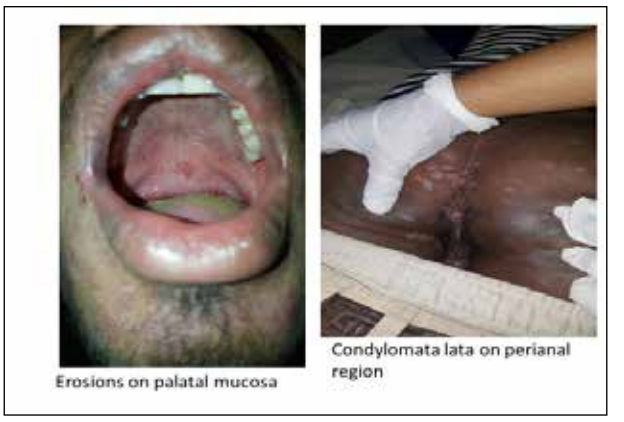
Md. Saidul a 20 years old Muslim unmarried welding mechanics, from Mirpur, Dhaka came to our hospital on 11th December 2016 with the complaints of multiple red, scaly, elevated lesions on both palms & soles, front and back of trunk, upper and lower extremities, face, scalp, and genitalias for 2½ months. Two and half months back, he noticed few red, elevated lesions over both palm, then lesions slightly enlarged and became dusky red and scaly. After few days, crops of same type of lesions appeared over both palms and soles, upper and lower extremities, front and back of the trunk, genitalias, face and scalp. Lesions were not associated with itching or burning sensation. Some lesions were discrete, some were confluent. Some were shiny, some lesions became dry and scaly. Then he went to local doctor and took some medicine. But there was no improvement. Within 7days, almost all parts of the body were involved by same types of lesions. Patient gave history of a penile ulcer 4months back which was not painful. He took some medicine but ulcer was persisting for around 1½ months, then healed spontaneously. He gave no history of fever, weight loss, anorexia, joint pain during the attack. His bowel and bladder habit were normal. He was normotensive, non-diabetic, non-asthmatic. He gave history of unprotected sexual exposure for several times with sex workers 5 months back . On general examination

1. *Mohsena Akter, Assistant professor, Department of Dermatology & Venereology, ZH Sikder Women's Medical College & Hospital, Dhaka.
2. Shahadat Hossain, Professor & Head of the Department of Dermatology &Venereology, Shaheed Suhrawardy Medical College & Hospital, Dhaka.
3. Zulfiqur Hossain Khan, Professor & Head of the Department of Dermatology & Venereology, Mugda Medical College Hospital, Dhaka.
4. Ishrat Bhuiyan, Associate Professor, Department of Dermatology & Venereology, Shaheed Suhrawardy Medical College & Hospital, Dhaka
5. Md. Zakir Hossain, Medical Officer, Department of Dermatology & Venereology Shaheed Suhrawardy Medical College & Hospital, Dhaka
6. Syed Shair Ahmed, Assistant Registrar, Department of Dermatology & Venereology, ZH. Women's Medical College & Hospital, Dhaka

***Address or correspondence:** Dr. Mohsena Akter, Assistant professor, Department of Dermatology and Venereology, Z H Sikder Women's Medical College and Hospital, Dhaka, Shahadat Hossain, Zulfiqur Hossain Khan, Ishrat Bhuiyan, Md. Zakir Hossain, Syed Shair Ahmed

patient was normal looking with average body built, pulse 80 b/min, BP-110/70 mm Hg, temperature was normal. On examination of integumentary system, bilaterally involved multiple shiny papules and plaques of various sizes and shapes, some lesions were erythematous, some were coppery red colored, some were violacious, some were discrete, some were confluent, some were covered by adherent scales; present over front and back of the trunk, flexor & extensor aspects of upper and lower extremities, both palms and soles, face, scalp and genitalias. Surface of the plaques were rough and covered by scales. Ollendorf's sign was present,. Auspitz sign and Wickham striae were absent. There were multiple different sizes and irregular shapes patches and plaques with ill-defined border present over palatal mucosa which is non-tender. Some were covered by whitish membrane. There were some condylomata lata present over perianal region. Lesions are non-tender,. Both sided posterior chain of cervical lymphnodes, supra clavicular, axillary and inguinal lymphnodes were palpable, non-tender, discrete, mobile, rubbery firm in consistency. Cervical and axillary lymphnodes were measuring approximately 1cm×5cm, and inguinal lymphnodes were measuring approximately 2cm×5cm. All other systemic examinations revealed normal findings. Our provisional diagnosis was Secondary Syphilis. We advised the patient all routine investigations, Serological tests for syphilis and skin biopsy for histopathology to exclude differential dignosis. But patient refused to do skin biopsy. In routine investigations CBC: WBC- 9720/cmm, Platelet- 378000/cmm, Hb- 14 g /dl, ESR- 34 mm/1st hour. Differential count-Neutrophils-71.9%, Lymphocytes-18.2%, Monocytes-5.5%. Random blood sugar, Serum creatinine, Serum SGPT, Chest X-RAY P/A view, ECG, USG of whole abdomen were normal. In Serological test, VDRL Qualitative : Reactive (strongly),VDRL Quantitative : 1:128, TPHA : Positive (1:1280), HIV1&2 screening : Negative. We confirmed our diagnosis as a case of Secondary syphilis (i.e, Syphiloderma). The patient was treated with single dose of inj. Benzathine penicillin G 24 lacs unit (12 lac unit deep I/M in each buttock) after skin sensitivity test. Follow up was done after 1 week, oral and genital lesions were healed and there was only some post inflammatory hyperpigmentation on face, trunk and extremities. After 2 weeks patient came without any complaints and patient was advised for follow up after 3 months with VDRL titre.


Multiple erythematous, violecious shiny plaques of different sizes ,some are covered by scale present on back .



Discussion

In the past decade, syphilis has re-emerged as a significant global health problem. Its reputation as "the great imitator" can cause clinical recognition to be difficult. Clinicians need to be aware of the various presentations of syphilis, including cutaneous manifestations.[8]

Syphilis is an infection caused by Treponema pallidum subspecies pallidum. Many of its manifestations are cutaneous, making it of interest and importance to dermatologists.[2]

Whether syphilis arose in the New World, the Old World, or both remains a controversial subject. Pandemics of syphilis began in the Old World in Naples, Italy, 1 year after Columbus returned from the New World. The disease takes its name from a poem, called Syphilis, Sive Morbus Gallicus (Syphilis, or the French Disease), written in 1530 by Giralomo Fracastoro, a physician and poet of Verona. Part of the poem recounts the story of a shepherd, named Syphilus, who, as punishment for angering Apollo, was afflicted with the disease known as syphilis.[2]

The World Health Organization (WHO) estimates in 2008 there were about 36.4 million adults between the ages of 15 and 49 years who were living with syphilis . The highest rates of infection were reported from the WHO African region with an incidence of 8.5 and 9.4 cases per 1000 and a prevalence of 3.5% and 3.9% for females and males, respectively. Slightly lower prevalence was reported from Latin America and South-East Asia (1.3–1.5 %) and the eastern Mediterranean region (1.2%).[1]

Syphilis occurs in sexually active individuals of all ages and is commoner in young adults.[1]

Although there is marked preponderance of cases in males, this sex difference relates to patterns of sexual behaviour and other social factors rather than to any sex difference in risk of acquisition. It is generally considered that male to female transmission is more efficient.1

Transmission is usually sexual contact with infectious lesion (chancre, mucous patch, condyloma latum, cutaneous lesions of secondary syphilis). Non sexual transmission occur by blood and transplacentally.

The incubation period of syphilis is generally given as 9–90 days, and varies inversely with the size of the spirochaete inoculum. Typically, most genital primary sores appear 3 weeks after exposure.[1]

The clinical presentation of syphilis is extremely diverse and may occur decades after the initial infection. Syphilis, if untreated, may pass through four stages: primary, secondary, latent and late. The first two stages are contagious.[1]

Syphilis passes through four distinct clinical phases:

1. Primary stage, characterized by a chancre.

2. Secondary stage, characterized typically by skin eruption(s) with or without lymphadenopathy and organ disease.

3. A latent period of varied duration, characterized by the absence of signs or symptoms of disease, with only reactive serologic tests as evidence of infection.

4. Tertiary stage, with cutaneous, neurologic, or cardiovascular manifestations.[2]

In primary syphilis , genital or extragenital lesion may be noted. A primary lesion (Chancre) begin as a macule,then progress to a papule which soon becomes eroded. The typical primary lesion is single ,painless, induratd, well-defined, circular or oval and exudes clear serum.[6]. Unless secondarily infected, primary sores are not painful.[6] In 60%–70% of cases of primary syphilis, painless regional lymphadenopathy arises 7–10 days after the chancre appears, especially when the chancre's location is genital. Unilateral lymphadenopathy is more common earlier in the course of disease, with bilateral involvement later in the course Unilateral or bilateral Inguinal lymphadenopathy is usually non painful, non-suppurative begin 1-2 weeks after chancre.[2]

In Secondary syphilis, constitutional symptom may precede 1st sign of generalization. Patient may present with low grade fever, headache, myalgia. The skin manifestations of secondary syphilis occur in 80% or more of patients with secondary syphilis. [3]The early eruptions are symmetric, more or less generalized, superficial, nondestructive, exanthematous, transient, and macular; later they are maculopapular or papular eruptions, papulosquamous, which are usually polymorphous, and less often, scaly, pustular, or pigmented. The rashes are coppery red. The early manifestations tend to be distributed over the face, shoulders, flanks, palms and soles, and anal or genital regions. The severity varies widely. The presence of lesions on the palms and soles is strongly suggestive.[3]

Our patient presented to us with bilateral symmetric eruption of coppery red colored macules, maculopapules, plaques over face, trunk, extremities, palms & soles which are asymptomatic. Pityriasis rosea may be mistaken for secondary syphilis, especially because both begin on the trunk. The herald patch, the oval patches with a fine scale at the edge, patterned in the lines of skin cleavage, the absence of lymphadenopathy, and infrequent mucous membrane lesions help to distinguish pityriasis rosea from secondary syphilis. Drug eruptions may produce a similar picture to secondary syphilis but tend to be morbilliform and also pruritic, whereas secondary syphilis is not. Drug eruptions in pityriasis rosea are often pruritic, whereas those in secondary syphilis usually are not .[3] In Psoriasis auspitz sign and koebner phenomenon is present which is absent in Secondary

Syphilis. Patient had generalized lymphadenopathy. Patient had no constitutional symptom. Our patient's routine investigation were normal but in serological test both treponemal & non treponemal tests were reactive with high titre. We gave the patient Inj. Benzathine Penicillin and after 2 weeks' patient came without any lesion.

Diagnosis of Syphilis

The diagnosis of syphilis involves non treponemal test such as RPR OR VDRL (Venereal Disease Research Laboratory) screen for disease followed by a treponemal antibody test .[5] Examples of treponemal serologic tests include the T. pallidum particle agglutination (TPPA) test, the microhemagglutination assay for T. pallidum (MHA-TP), the fluorescent treponemal antibody absorption assay (FTA-ABS), the T. pallidum haemagglutination test (TPHA), and treponemal enzyme immunoassays (EIAs) and immune-chemiluminescence assays.[2]

Treatment

Penicillin remains the drug of choice for treatment of all stages of syphilis. Erythromycin is not recommended for treatment of any stage or form of syphilis. HIV testing is recommended in all patients with syphilis. Patients with primary, secondary, or early latent syphilis known to be of less than 1 year in duration can be treated with a single intramuscular injection of 2.4 million units (mega units, MU) of benzathine penicillin G.[3] Patient with primary and secondary syphilis undergo serological and clinical evaluation at 6 and 12 months to be assessed for treatment failure or reinfection. Sexual contact of patients with syphilis deserve evaluation.[5]

Conclusion

Due to recrudescence of syphilis in last decades we have to aware and concerned when evaluating asymptomatic skin lesions.

References

1. Tony Burns, Stephen, Neil Cox, Christopher (Editors): Rook's Text book of Dermatology, Infections & Infestation,Vol-1.8th edition, Wiley-Black Well; 2016: 29.3-29.13.
2. Klaus, Lowell A, Stephen, Barbara Amy, David(editors)In: Fitzpatrick's Dermatology in General Medicine, Sexually transmited disease; Syphilis, Vol -2,8TH edition, McGraw Hill;2008: 2471-2490.
3. William D.James, Timothy G.Berger, Dirk M.Elston, Isaac M. Neulras (editors): Andrews' Diseases of the skin, Syphilis, Yaws, Bejel, and Pinta ,13th edition, Elsevier;2020: 347-358.
4. Klaus Wolff, Richard Allen Johnson (Editor): Color atlas & synopsis of clinical dermatology, Sexually transmitted infections, Syphilis, Sixth edition;2009: 919-930.
5. Emma Coleman, Andre Fiahlo& Andrei Brateanu; Secondary Syphilis- A case report, Cleveland clinic journal of Medicine; July 2017, 84(7)510-511.
6. Arya OP, Osoba AO, Bennet FJ. Tropical venereology, 2nd edition, Churcill Livingstone, 1988:52.
7. Baughn R E, and Musher D M. Secondary Syphilitic lesion, Clinical Microbiology Reviews, Jan. 2005, 18: 205–216.
8. Steinhoff N, Wanner B, Miller R. A Case of Secondary Syphilis with Oral Findings. Available from: URL: https://cdn.ymaws.com/www.aocd.org/resource/resmgr/jaocd/contents/volume40/40-16.pdf

General Instructions for the Authors

The minimum requirements for manuscripts submitted for publication:

The manuscript should be prepared according to the modified Vancouver style as proposed by the International Committee of Medical Journal Editors (ICMJE). The entire Uniform Requirements document was revised in 1997 which is available in the Journal of American Medical Association (JAMA.1997; 277:927-934) and is also available at the JAMA website. Sections were updated in May 1999 and May 2000. The following section is based mostly on May 2000 update.

THREE COPIES of the manuscript should be sent in a heavy paper envelope. Manuscripts must accompany a covering letter signed by all authors. This must include (i) information on prior or duplicate publication or submission elsewhere of any part of the work as defined earlier in this document; (ii) a statement of financial or other relationships that might lead to a conflict of interest; (iii) a statement that the manuscript has been read and approved by all the authors, that the requirements for authorship have been met; and (iv) the name, address and telephone number of the corresponding author, who is responsible for communicating with the other authors about revisions and final approval of the proofs. The letter should give any additional information that may be helpful to the editor.

A good quality compact disc (CD) must accompany the printed copies of the manuscript containing an electronic copy of the manuscript prepared in Microsoft Word 6.0 or later version.

Prepare manuscript as per the following guidelines

DOUBLE-SPACE all parts of manuscripts.

TYPE or PRINT on only one side of the paper. Number pages consecutively, beginning with the title page. Put the page number in the lower right-hand corner of each page.

BEGIN, ON A NEW PAGE, each section or component with following sequence: title page, abstract and key words, text, acknowledgments, references. Tables, figures and illustrations may be positioned within the text where they should appear.

The **TEXT** of observational and experimental articles is usually divided into sections with the headings of Introduction, Methods, Results, and Discussion. Long articles may need subheadings within some sections (especially within the Results and Discussion sections) to clarify their content. Other types of articles, such as case report, review, and editorial, are likely to need other formats.

The TITLE PAGE should carry (i) the title of the article, which should be concise but informative; (ii) the name by which each author is known, with his or her highest academic degree and institutional affiliation; (iii) the name of the department and the institution to which the work should be attributed; (iv) disclaimers, if any; (v) the name and address of the author responsible for correspondence concerning the manuscript; and (vi) sources of support in the form of grants, equipment, or drugs.

The **ABSTRACT** should be in second page and should usually be not more than 150 words for unstructured abstracts (review article) or 250 words for structured abstracts (original article). The structured abstract should have following sections: (i) Objective(s), (ii) Materials and methods, (iii) Place and period of work, (iv) Results, and (v) Conclusion. The abstract should state the purposes of the study or investigation, basic procedures (selection of study subjects or laboratory animals, observational and analytical methods), main findings (giving specific data and their statistical significance, if possible), and the principal conclusions. It should emphasize new and important aspects of the study or observations.

Below the abstract, authors should provide 3 to 10 KEY WORDS or short phrases that will assist indexers in cross-indexing the article and that may be published with the abstract. Terms from the medical subject headings (MESH) list of Index Medicus should preferably be used.

INTRODUCTION should state the purpose of the article and summarize the rationale for the study or observation. Give only strictly pertinent references and do not include data or conclusions from the work being reported.

In **MATERIALS AND METHODS** section describe your selection of the observational or experimental subjects (patients or laboratory animals, including controls) clearly. Identify the age, sex, and other important characteristics of the subjects. Identify the methods, apparatus (give the manufacturer's name and address in parentheses), and procedures in sufficient detail to allow other workers to reproduce the results. Give references to established methods, including statistical methods; provide references and brief descriptions for methods that have been published but are not well known; describe new or substantially modified methods, give reasons for using them, and evaluate their limitations. Precisely identify all drugs and chemicals used, including generic name, dose, and route of administration. Reports of randomized clinical trials should present information on all major study elements including the protocol (study population, interventions or exposures, outcomes, and the rationale

for statistical analysis), assignment of interventions (methods of randomization, concealment of allocation to treatment groups), and the method of masking (blinding). Authors submitting review manuscripts are advised to include a section describing the methods used for locating, selecting, extracting, and synthesizing data.

In **RESULTS** section, when data are summarized, specify the statistical methods used to analyze them. Present your results in a logical sequence in the text, tables, and illustrations. Do not repeat in the text all the data in the tables or illustrations; emphasize or summarize only important observations. Restrict tables and figures to those needed to explain the argument of the paper and to assess its support. Use graphs as an alternative to tables with many entries; do not duplicate data in graphs and tables. Number tables consecutively in the order of their first citation in the text, and supply a brief title for each. Give each column a short or abbreviated heading. Place explanatory matter in footnotes, not in the heading. Identify statistical measures of variations such as standard deviation and standard error of the mean. Do not use internal horizontal and vertical rules. Be sure that each table is cited in the text. Figures should be professionally drawn and photographed. Supply raw data in separate page so that the figures may be redrawn. For x-ray films, and other material, send sharp, glossy, black-and-white photographic prints, usually 127 x 173 mm (5 x 7 in) but no larger than 203 x 254 mm (8 x 10 in).

In **DISCUSSION**, emphasize the new and important aspects of the study and the conclusions that follow from them. Do not repeat in detail data or other material given in the Introduction or the Results section. Include in the Discussion section the implications of the findings and their limitations, including implications for future research. Relate the observations to other relevant studies.

Link the **CONCLUSIONS** with the goals of the study, but avoid unqualified statements and conclusions not completely supported by the data. State new hypotheses when warranted, but clearly label them as such. Recommendations, when appropriate, may be included.

ACKNOWLEDGMENTS may go as an appendix to the text, one or more statements may specify (i) contributions that need acknowledging but do not justify authorship, such as general support by a departmental chair; (ii) acknowledgments of technical help; (iii) acknowledgments of financial and material support, which should specify the nature of the support.

REFERENCES should be numbered consecutively in the order in which they are first mentioned in the text. Identify references in text, tables, and legends by Arabic numerals in parentheses. References cited only in tables or figure legends should be numbered in accordance with the sequence established by the first identification in the text of the particular table or figure.

Use the style of the examples below, which are based on the formats used by the NLM in Index Medicus. The titles of journals should be abbreviated according to the style used in Index Medicus. Consult the List of Journals Indexed in Index Medicus, published annually as a separate publication by the library and as a list in the January issue of Index Medicus. The list can also be obtained through the library's web site (http://www.nlm.nih.gov/).

Avoid using abstracts as references. References to papers accepted but not yet published should be designated as "in press" or "forthcoming"; authors should obtain written permission to cite such papers as well as verification that they have been accepted for publication. Information from manuscripts submitted but not accepted should be cited in the text as "unpublished observations" with written permission from the source.

Avoid citing a "personal communication" unless it provides essential information not available from a public source, in which case the name of the person and date of communication should be cited in parentheses in the text. For scientific articles, authors should obtain written permission and confirmation of accuracy from the source of a personal communication.

The references must be verified by the author(s) against the original documents.

The Uniform Requirements style (the Vancouver style) is based largely on an ANSI standard style adapted by the NLM for its databases. Notes have been added where Vancouver style differs from the style now used by NLM.

Standard journal article

List the first six authors followed by et al. (Note: NLM now lists up through 25 authors; if there are more than 25 authors, NLM lists the first 24, then the last author, then et al.)

Vega KJ, Pina I, Krevsky B. Heart transplantation is associated with an increased risk for pancreatobiliary disease. Ann Intern Med 1996 Jun 1; 124 (11): 980-3.

More than six authors

Parkin DM, Clayton D, Black RJ, Masuyer E, Friedl HP, Ivanov E, et al. Childhood leukemia in Europe after Chernobyl: 5 year follow-up. Br J Cancer 1996; 73: 1006- 12.

Organization as author

The Cardiac Society of Australia and New Zealand. Clinical exercise stress testing. Safety and performance guidelines. Med J Aust 1996; 164: 282-4.

No author given

Cancer in South Africa [editorial]. S Afr Med J 1994; 84:15.

Article not in English

(Note: NLM translates the title to English, encloses the translation in square brackets, and adds an abbreviated language designator.) Ryder TE, Haukeland EA, Solhaug JH. Bilateral infrapatellar seneruptur hostidligere frisk kvinne. Tidsskr Nor Laegeforen 1996; 116:41-2.

Volume with supplement

Shen HM, Zhang QF. Risk assessment of nickel carcinogenicity and occupational lung cancer. Environ Health Perspect 1994; 102 Suppl 1:275-82. Issue with supplement:

Payne DK, Sullivan MD, Massie MJ. Women's psychological reactions to breast cancer. Semin Oncol 1996; 23(1 Suppl 2): 89-97.

Volume with part

Ozben T, Nacitarhan S, Tuncer N. Plasma and urine sialic acid in non-insulin dependent diabetes mellitus. Ann Clin Biochem 1995; 32(Pt 3): 303-6.

Issue with part

Poole GH, Mills SM. One hundred consecutive cases of flap lacerations of the leg in ageing patients. N Z Med J 1994; 107(986 Pt 1): 377-8.

Issue with no volume:

Turan I, Wredmark T, Fellander-Tsai L. Arthroscopic ankle arthrodesis in rheumatoid arthritis. Clin Orthop 1995; (320): 110-4.

No issue or volume

Browell DA, Lennard TW. Immunologic status of the cancer patient and the effects of blood transfusion on antitumor responses. Curr Opin Gen Surg 1993:325-33.

Pagination in Roman numerals

Fisher GA, Sikic BI. Drug resistance in clinical oncology and hematology. Introduction. Hematol Oncol Clin North Am 1995 Apr; 9(2): xi-xii.

Type of article indicated as needed

Enzensberger W, Fischer PA. Metronome in Parkinson's disease [letter]. Lancet 1996; 347:1337. Clement J, De Bock R. Hematological complications of Hantavirus nephropathy (HVN) [abstract]. Kidney Int 1992; 42:1285.

Article containing retraction

Garey CE, Schwarzman AL, Rise ML, Seyfried TN. Ceruloplasmin gene defect associated with epilepsy in EL mice [retraction of Garey CE, Schwarzman AL, Rise ML, Seyfried TN. In: Nat Genet 1994; 6:426-31]. Nat Genet 1995; 11:104.

Article retracted

Liou GI, Wang M, Matragoon S. Precocious IRBP gene expression during mouse development [retracted in Invest Ophthalmol Vis Sci 1994; 35:3127]. Invest Ophthalmol Vis Sci 1994; 35:1083-8.

Article with published erratum

Hamlin JA, Kahn AM. Herniography in symptomatic patients following inguinal hernia repair [published erratum appears in West J Med 1995; 162:278]. West J Med 1995; 162:28-31.

Books and Other Monographs

(Note: Previous Vancouver style incorrectly had a comma rather than a semicolon between the publisher and the date.)

Personal author(s)

Ringsven MK, Bond D. Gerontology and leadership skills for nurses. 2nd ed. Albany (NY): Delmar Publishers; 1996.

Editor(s), compiler(s) as author

Norman IJ, Redfern SJ, editors. Mental health care for elderly people. New York: Churchill Livingstone; 1996.

Organization as author and publisher

Institute of Medicine (US). Looking at the future of the Medicaid program. Washington: The Institute; 1992.

Chapter in a book

(Note: Previous Vancouver style had a colon rather than a p before pagination.) Phillips SJ, Whisnant JP. Hypertension and stroke. In: Laragh JH, Brenner BM, editors. Hypertension: pathophysiology, diagnosis, and management. 2nd ed. New York: Raven Press; 1995. p. 465-78.

Conference proceedings

Kimura J, Shibasaki H, editors. Recent advances in clinical neurophysiology. Proceedings of the 10th International Congress of EMG and Clinical Neurophysiology; 1995 Oct 15-19; Kyoto, Japan. Amsterdam: Elsevier; 1996.

Conference paper

Bengtsson S, Solheim BG. Enforcement of data protection, privacy and security in medical informatics. In: Lun KC, Degoulet P, Piemme TE, Rienhoff O, editors. MEDINFO 92. Proceedings of the 7th World Congress on Medical Informatics; 1992 Sep 6-10; Geneva, Switzerland. Amsterdam: North-Holland; 1992. p. 1561-5.

Scientific or technical report

Issued by funding/sponsoring agency: Smith P, Golladay K. Payment for durable medical equipment billed during skilled nursing facility stays. Final report. Dallas (TX): Dept. of Health and Human Services (US), Office of Evaluation and Inspections; 1994 Oct. Report No.: HHSIGOEI69200860. Issued by performing agency: Field MJ, Tranquada RE, Feasley JC, editors. Health services research: work force and educational issues. Washington: National Academy Press; 1995. Contract No.: AHCPR282942008. Sponsored by the Agency for Health Care Policy and Research. Dissertation:

Kaplan SJ. Post-hospital home health care: the elderly's access and utilization [dissertation]. St. Louis (MO): Washington Univ.; 1995.

Patent: Larsen CE, Trip R, Johnson CR, inventors; Novoste Corporation, assignee. Methods for procedures related to the electrophysiology of the heart. US patent 5,529,067. 1995 Jun 25.

Other Published Material

Newspaper article

Lee G. Hospitalizations tied to ozone pollution: study estimates 50,000 admissions annually. The Washington Post 1996 Jun 21; Sect. A: 3 (col. 5).

Audiovisual material

HIV+/AIDS: the facts and the future [videocassette]. St. Louis (MO): Mosby-Year Book; 1995.

Legal material

Public law

Preventive Health Amendments of 1993, Pub. L. No. 103-183, 107 Stat. 2226 (Dec. 14, 1993).

Un enacted bill

Medical Records Confidentiality Act of 1995, S. 1360, 104th Cong., 1st Sess. (1995).

Code of Federal Regulations

Informed Consent, 42 C.F.R. Sect. 441.257 (1995).

Hearing

Increased Drug Abuse: the Impact on the Nation's Emergency Rooms: Hearings Before the Subcomm. On Human Resources and Intergovernmental Relations of the House Comm. on Government Operations, 103rd Cong., 1st Sess. (May 26, 1993).

Map

North Carolina. Tuberculosis rates per 100,000 population, 1990 [demographic map]. Raleigh: North Carolina Dept. of Environment, Health, and Natural Resources, Div. of Epidemiology; 1991.

Book of the Bible

The Holy Bible. King James Version. Grand Rapids (MI): Zondervan Publishing House; 1995. Ruth 3:1-18.

Dictionary and similar references

Stedman's medical dictionary. 26th ed. Baltimore: Williams & Wilkins; 1995. Apraxia; p. 119-20.

Classical material

The Winter's Tale: act 5, scene 1, lines 13-16. The complete works of William Shakespeare. London: Rex; 1973.

Unpublished Material

In press

(Note: NLM prefers "forthcoming" because not all items will be printed.) Leshner AI. Molecular mechanisms of cocaine addiction. N Engl J Med. In press 1996.

Electronic Material

Journal article in electronic format: Morse SS. Factors in the emergence of infectious diseases. Emerg Infect Dis [serial online] 1995 Jan-Mar [cited 1996 Jun 5]; 1(1): [24 screens]. Available from: URL: http://www.cdc.gov/ncidod/EID/eid.htm

Monograph in electronic format

CDI, clinical dermatology illustrated [monograph on CD-ROM]. Reeves JRT, Maibach H. CMEA Multimedia Group, producers. 2nd ed. Version 2.0. San Diego: CMEA; 1995.

Computer file

Hemodynamics III: the ups and downs of hemodynamics [computer program]. Version 2.2. Orlando (FL): Computerized Educational Systems; 1993.

MEASUREMENTS of length, height, weight, and volume should be reported in metric units (meter, kilogram, or liter) or their decimal multiples. Temperatures should be given in degrees Celsius. Blood pressures should be given in millimeters of mercury. All hematological and clinical chemistry measurements should be reported in the metric system in terms of the International System of Units (SI).

Use only standard ABBREVIATIONS. Avoid abbreviations in the title and abstract. The full term for which an abbreviation stands should precede its first use in the text unless it is a standard unit of measurement.

THE EDITOR reserves the right to style and if necessary, shorten material accepted for publication and to determine the priority and time of publication.