Who Said That? Immunologist

Lesson Idea by: Heather Leask, Gateway Community Learning Center, North Okanagan-Shuswap School District

Having a strong immune system is essential for good health. Your ability to resist infection governs everything from how well you feel every day, to how often you get colds, to your chances of surviving potentially fatal infections. Your immune system is involved in everything from allergic reactions to why you get vaccinations.

Immunology is the study of immunity. An immunologist is the medical scientist who specializes in the study of the immune system.

"In science, the idea is to question what is written, to be critical, and to identify problems and errors," says Dr. Ben Koop of the Molecular Evolution and Immunology Group at the University of Victoria.

Before any of his work gets published, it goes through a process called "peer review."

"As an immunologist, all of my work is reviewed by at least three or four peers," notes Koop. "Everything I write and all of my research is reviewed, and at the end of three years, when I go to renew grants, that's also reviewed by a panel of around 10 to 15 peers."

Such review safeguards the accuracy of the information. It's essential for every scientist, including immunologists, to produce accurate reports on their work. This allows others to build on their research, which leads to better understanding of the subject. In the case of immunology, research saves lives.

"To be comfortable with the credibility of things you read, you have to know where they're coming from," says Koop. "So in the levels of credibility, first there are peer review scientific journals, which are reviewed by at least three peers. Second are 'point of view' articles written by experts, and lastly are newspapers or popular literature written by non-experts."

In technical reports, immunologist may borrow information from other sources. In order not to be accused of plagiarizing, they must carefully document those sources. A documented report proves that the researcher is giving credit where credit is due and that the findings can be collabourated.

Collect a variety of published materials, including newspapers, magazines, books, copies of public lectures, scientific journals, and documents downloaded from the Internet. In groups, review a selection of the documents.

Find examples of documentation in the articles. Discuss the following:

- What kinds of sources are being used?
- How are the sources being cited?
- Why would a reader want to know the source of a particular statement?

Also find examples of information that you think should be documented. Discuss the following:

- What kinds of information are not sourced?
- Why do you think the information isn't sourced?
- In what cases should a source be cited?

Read the press release in the Practice file below. Most of the attribution in this press release has been deleted. As you read, mark all the places where you, as a reader, would like to know "Who said that?" When you're finished, compare your work to the Solution to Practice. This is a copy of the press release as it appeared online.

Discuss what you've learned with the class.

On your own or in groups, research the answers to the following questions. Do your research using textbooks, sources at the local library, or the Internet.

1. What system of documentation is frequently used in technical writing?
2. What if you can't remember where you got the information?
3. Do you document a conversation?
4. Where do you put the list of sources?
5. How do you document books?
6. How do you document magazine and journal articles?
7. How do you document reports?
8. How do you document correspondence or interviews?
9. How do you document brochures?
10. How do you document borrowed graphics?
11. How do you document electronic sources?

As a class, check your answers against those provided in the Solution to Principles section below. Discuss the results. Did everyone get the same answers? Where answers are different, figure out why they are different. Should the same system of documentation be used in every situation? In what situations would you use a different style of documentation?

You are an immunologist and you've been asked to edit an article called Natural History and Monitoring of HIV RNA in Children. See it in the Learn file below.

The article is in final draft form; the only thing you have to do is add the sources. Go through the article, adding the documentation based on the information found in Resources for Learn section below.

Check your work against the document labeled Solution to Learn.

You've just learned a great deal about the documentation required in technical writing. Write a summary of what you've learned, citing at least four different sources. Your target audience is your student peers.

Curriculum Organizer(s): - Writing, representing, and speaking - Reading, viewing and listening	Curriculum Sub-organizer(s): - Employ a variety of research tools and resources - Independently compile, with reference to particular purposes, information and ideas from a wide variety of secondary sources - Use appropriate conventions accurately and consistently to document sources
Prerequisites: · none	Resources: - Internet - Technical writing texts - Library

Practice File

BULLETIN!

For immediate release

Contact: Jo Ann Faber (847) 427-1200
Bob Szafranski Public Communications Inc. (312) 558-1770

ALLERGISTS CAUTION PARENTS: Don't Stop Children's Allergy Shots

ARLINGTON HEIGHTS, IL -- Allergists today warned parents of children with asthma not to stop their children's allergy shots -- called immunotherapy -- based on a recent study reported this week.

"Children who stop taking the shots could risk increased, and potentially serious, asthma

attacks," said a representative of a national health group.

The findings of the study do not reflect the experience of most practicing allergists and their patients, and they are inconsistent with most previously published studies about asthma and immunotherapy.

"Millions of children are being treated effectively with immunotherapy. It's essential that parents of asthmatics talk to their doctors before making any decisions about their children's treatment."

The warning on allergy shots is in response to a study published Thursday, suggesting allergy shots are probably unnecessary for children with moderate to severe asthma who follow a rigid medical regimen and live in allergen-free homes, a situation some allergists believe is unrealistic.

"The study looked at a very special group of children, not typical of a random sample of asthma sufferers in everyday settings. Researchers monitored their progress, gave them free allergy medication, and ensured compliance with optimal medical and environmental control. Any participants who didn't comply were dropped from the study."

The study didn't take into account common asthma triggers, such as cockroaches and certain tree and weed pollens.

"This study should be put in perspective. This is one negative study among numerous positive studies that support immunotherapy, a common and effective treatment for asthma in children."

In 1995, researchers analysed 20 allergen-immunotherapy studies conducted between 1960 and 1990 and concluded immunotherapy was effective. The findings were published in another health journal.

Asthma is an inflammation of the lung airways that affects more than 12 million Americans, including four million children. It results in more than 5,000 deaths per year.

Parents and others can receive more information about asthma and asthma treatment by calling ACAAI at 1-800-842-7777.

For more information, please contact:
American College of Allergy, Asthma and Immunology
85 West Algonquin Road, Suite 550
Arlington Heights, IL 60005
Phone: (847) 427-1200
Fax: (847) 427-1294

Solution to Practice

This is the press release as it appeared online at http://allergy.mcg.edu/.

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ARLINGTON HEIGHTS, IL, Jan. 31 -- Allergists today warned parents of children with asthma not to stop their children's allergy shots -- called immunotherapy -- based on a recent study reported this week.

"Children who stop taking the shots could risk increased, and potentially serious, asthma attacks," said Betty B. Wray, MD, president of the American College of Allergy, Asthma and Immunology (ACAAI).

The findings of the study do not reflect the experience of most practicing allergists and their patients, and they are inconsistent with most previously published studies about asthma and immunotherapy, Dr. Wray said.

"Millions of children are being treated effectively with immunotherapy," Dr. Wray said. "It's essential that parents of asthmatics talk to their doctors before making any decisions about their children's treatment."

ACAAI's warning on allergy shots is in response to a study published Thursday in the New England Journal of Medicine suggesting allergy shots are probably unnecessary for children with moderate to severe asthma who follow a rigid medical regimen and live in allergen-free homes, a situation Dr. Wray and other allergists believe is unrealistic.

"The study looked at a very special group of children, not typical of a random sample of asthma sufferers in everyday settings," Dr. Wray said. "Researchers monitored their progress, gave them free allergy medication, and ensured compliance with optimal medical and environmental control. Any participants who didn't comply were dropped from the study."

The ACAAI also noted that the study didn't take into account common asthma triggers, such as cockroaches and certain tree and weed pollens.

"This study should be put in perspective," Dr. Wray said. "This is one negative study among numerous positive studies that support immunotherapy, a common and effective treatment for asthma in children."

In 1995, Australian researchers analysed 20 allergen-immunotherapy studies conducted between 1960 and 1990 and concluded immunotherapy was effective. The findings were published in the American Journal of Respiratory Critical Care Medicine.

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Solution to Principles

"It's foremost for all researchers to practice the very highest degree of integrity because your entire reputation is based on being honest and speaking truthfully," says Dr. Ben Koop of the University of Victoria.

Because your reputation is based on the accuracy of the information you provide, it's crucial to provide proper documentation for all the sources that you use in your research findings.

Here are the answers to the 11 questions in the Learn section. The answers to the first 10 questions are used with permission of:

Dr. David McMurrey, author of the "Internet Technical Writing Course Guide"
http://www.gel.ulaval.ca/~poussart/gel64324/McMurrey/texte/acctoc.htm

The answer to the question 11 is complex. As the Internet is relatively new, there are many varying opinions on how to cite electronic sources. A sample answer to question 11 is provided using the following source:

Janice R. Walker, author of "Columbia Online Style: MLA-Style Citations of Electronic Sources," Version 1.2, Nov. 1997
http://www.columbia.edu/cu/cup/cgos/idx_basic.html

1. The number system of documentation is frequently used in technical writing.

2. If you honestly can't remember where you got some information, then you may consider that it has become common knowledge for you and does not need to be documented.

3. You must document all information, whether it's in print, heard in a conversation or interview, or obtained electronically.

4. Place the list of sources at the end of your document.

5. To document books, put the name of the author first (first name last), followed by a period, followed by the title of the book (in italics if you have them; otherwise, underline), followed by a period, followed by the city of the publisher, followed by a colon; followed by the publisher's name (delete details like "inc.," "Co.," and Ltd."), followed by the year of publication, ending with a period. In this style, you don't indicate the pages.

6. To document magazine and journal articles, start with the author's name first (last name first), followed by a period, then the title of the article in quotation marks and ending with a period, followed by the name of the magazine or journal (in italics if you have them; otherwise, underline), followed by a period, followed by the date of issue of the magazine the article appears in, followed by the beginning and ending page. If the article spreads across the magazine you can write "33+." or "33(5)." The latter style seems to be taking hold; in it, you estimate how many pages the article would be if it were continuous.

If there is no author, start with the article or book title. If there are two authors, add "and"

and the second author's name, first name first. If there are too many authors, use the first one (last name first), followed by "et al.," which means "and others."

7. When documenting reports, you're likely to be dealing with government or local informally produced reports. With most reports, you may not have an individual author name; in such cases, you use the group name as the author. For government reports, the publisher is often the Government Printing Office; the city of publication is typically Washington, D.C. Also, for government documents, you should include the document number.

8. When it comes to correspondence or interviews, you treat the interviewee or letter writer as the author, follow that name with the person's title, followed by a period, then the company name, followed by a period, then what the information was ("Personal interview" or "Personal correspondence") followed by a period, then the city and state, followed by a period, ending with the date.

9. For information sources like brochures, treat the company name as the author, followed by a period, use something identifying like the product name (including the specific model number), followed by anything that seems like the title of the brochure, followed by a period, ending with a date if you can find one (otherwise, put "N.d.").

10. Document borrowed graphics by indicating the source in the figure title, which is located just below the graphic. Provide the complete bibliographic details, plus the page number. See the example below:

Figure 3. Advanced MicroWidget Device. The new device of the whatzit reduces the requirements on the base system, while not compromising performance. Source: Alfred Newperson, Widget Design: The 1990s and Beyond (Summe City: Noveau, 1990), 32

11. The basic components to documenting electronic sources are:

Author's last name, Author's first name. "Title of Document." Title of Complete Work (if applicable). Version or File Number, if applicable. Document date or date of last revision (if different from access date). Protocol and address, access path or directories (date of access).

Learn

This is the article in which you must place the documentation for the information.

Natural History and Monitoring of HIV RNA in Children

Viral burden in the peripheral blood can be determined using quantitative HIV RNA assays. During primary infection in adults, there is an initial rise in HIV RNA copy number to very high peak levels. Coincident with the body's humoural and cell mediated immune response there is a sharp decline in RNA levels by as much as two to three log copies to reach a stable lower level 10 ("virologic set-point") approximately six to 12 months following acute infection, reflecting the balance between ongoing viral production and immune elimination. Several studies in adults have shown that infected individuals with lower HIV copy number at the time of RNA stabilization have slower progression and improved survival compared to those with high HIV RNA set points. Based on such data, recommendations for use of HIV RNA copy number in deciding to initiate and change

antiretroviral therapy in infected adults have been made; these recommendations are also applicable to infected adolescents, particularly those adolescents who have acquired HIV infection via drug use and/or sexual contact. Many working group members also believe that these recommendations are applicable to perinatally-infected children older than three years of age.

The HIV RNA pattern among perinatally-infected infants differs from that seen in infected adults. Very high HIV RNA copy numbers appear to persist among infected children for prolonged periods. In one large prospective study, HIV RNA levels were generally low at birth (<10,000 copies/mL), rose to extremely high values within the first two months of life (most infants had values >100,000 copies/mL, ranging from undetectable in rare infants to nearly 10 million copies/mL), and then fell very slowly; the mean HIV RNA level during the first year of life was 185,000 copies/mL. Additionally, in contrast to the adult pattern, after the first year of life, HIV RNA copy number only slowly declines over the next few years of life. This pattern likely reflects the lower efficiency of an immature but developing immune system in containing viral replication, and possibly a greater number of HIV-susceptible cells in the infant.

Recent data indicate that very high HIV RNA levels in infants under 12 months of age (over 300,000 copies/mL) may be correlated with disease progression and death; however, there was considerable overlap in RNA levels between rapid and non-rapid progressors. High RNA levels (above 100,000 copies/mL) in young infants have also been shown to be associated with high risk for disease progression and mortality, particularly if the CD4+ lymphocyte percentage is under 15%. (Tables 4-6) Similar findings have been reported in a preliminary analysis of data from pediatric clinical trial PACTG 152 correlating baseline virologic data with risk of disease progression or death during study follow-up. (Table 6) In this study, there was a 54% reduction in the relative risk of progression for each one log decrease in baseline HIV RNA level. Disease progression was 10 documented in 11% of children 30 months old or less at entry (mean age, 1.1 years) with baseline RNA in the lowest quartile (undetectable to 150,000 copies/mL) compared to 52% of those with baseline RNA in the highest quartile (>1,700,000 copies/mL). Among children over 30 months old at entry (mean age, 7.3 years), none of those with baseline RNA in the lowest quartile (undetectable to 15,000 copies/mL) compared to 34% of those in the highest quartile (>150,000 copies/mL) had progression; children with RNA levels in the middle two quartiles (15,000 to 50,000 and 50,000 to 150,000 copies/mL) had similar progression rates (13% and 16%, respectively). The data from children over 30 months of age are similar to data from studies among infected adults, where the risk of disease progression dramatically increases when HIV RNA levels exceed 10,000 to 20,000 copies/mL.

Despite these data, the predictive value of specific HIV RNA levels for disease progression and death for an individual child is relatively poor. HIV RNA levels may be particularly difficult to interpret during the first year of life because levels are extremely high and there is marked overlap in levels between rapid and non-rapid progressors. Additional data indicate that baseline as well as changes in HIV RNA copy number and CD4+ lymphocyte percent over time each independently contribute to prediction of mortality risk in infected children, and the use of the two markers together may more accurately define prognosis. Similar data and conclusions have recently been reported from several studies in infected adults.

Resources for Learn

Build your documentation drawing from the information below. Please note that instead of

article titles, brief descriptions of the studies are provided. References do not appear in the same order here as they are required in the article.

- The hypothesis that HIV viral load early in life can predict the course of the disease in infected babies was covered at the 11th International Conference on AIDS held in Vancouver, Canada July 7-12. Involved in the study were EJ Abrams, JC Weedon, G Lambert, R Steketee who are involved in the New York City Perinatal HIV Transmission Collabourative Study. Details were published in the conference Abstract We.B.311.
- A team of researchers including TL Katzenstein, C. Pedersen, C. Nielson, JD Lundgren, PH Jakobsen, and J Gerstoft found that there is a quick decline in RNA levels following acute infection in their longitudinal serum HIV RNA quantification work. This confirmed the data also reported by DR Henrard and others in 1995. The results of the Katzenstein study were found on pages 167-173 of issue 10 of the journal called AIDS. It was published in 1996.
- The Journal of Infectious Disease (1997;175:1029-38) reported in 1997 on a study by LM Mofenson, J Korelitz, WA Meyer and other researchers about the relationship between serum human immunodeficiency virus type 1 (HIV-1) RNA level, CD4 lymphocyte percent, and long-term mortality risk in HIV-1-infected children.
- Both Mellors and Clementi studies showed that infected adults with high HIV RNA set points are less likely to survive than those with lower set points.
- M Clementi worked with S Menzo, P Bagnarelli and others on a study about the clinical use of quantitative molecular methods in studying human immunodeficiency virus type 1 infection. The study appeared in Clinical Microbiological Reviews in 1996, on pages 135-147 of issue 9.
- In 1997, the Public Health Service in Washington, D.C., hosted a Panel on Clinical Practices for Treatments of HIV Infection. The panel set out the guidelines for the use of antiretroviral agents in HIV-infected adults and adolescents.
- Researchers including MD Hughes, VA Johnson, and MS Hirsch reported on their study involving the monitoring plasma HIV-1 RNA levels in addition to CD4+ lymphocyte count. They found this improves the assessment of a patient's response to antiretroviral therapeutic measures. Reported in the journal: Annals of Internal Medicine, 1997; 126:929-38.
- JW Mellors worked with LA Kingsley and CR Rinaldo and some others on his study: Quantification of HIV-1 RNA in plasma predicts outcome after seroconversion. The study appeared in Annals of Internal Medicine in 1995. It was published in issue 122 on pages 573-579.
- Infants infected with HIV were the focus of a study by a team of researchers led by WT Shearer, TC Quinn, P LaRussa. They studied the progress of the disease and changes in viral load. Their results were published in the New England Journal of Medicine, in 1997, Issue 336, pages 1337-1342.
- Researchers including PE Palumbo, SH Kwok, and S Waters, published the results of their work on viral measurement by polymerase chain reaction-based assays in infants with HIV in the Journal of Pediatrics 1995; issue 126, pages 592-595.
- A study on age- and time-related changes in extracellular viral load in children vertically infected by human immunodeficiency virus done by K McIntosh, A Shevitz, D Zaknun, and others was reported on in the Pediatric Infectious Diseases Journal in 1996; Issue 15, pages 1087-91.
- Those attending the 4th Conference on Retroviruses and Opportunistic Infections held in Washington, D.C., Jan. 22-26, 1997 learned more about the Correlation of HIV plasma RNA levels with clinical outcome in a large pediatric trial conducted by PE Palumbo, C Raskino, S Fiscus, and others. Cited in the conference proceedings 208 (Abs.LB14).
- The Annals of Internal Medicine published an article by JW Mellors, A Munoz, JV Giorgi, on the subject of plasma viral load and CD4+ lymphocytes as prognostic markers of HIV-1 infection. Published in 1997. Issue 126, pages 946-54.

- Changes in plasma HIV RNA levels and CD4+ lymphocyte counts predict both response to antiretroviral therapy and therapeutic failure, reported WA O'Brien, PM Hartigan, ES Daar, MS Simberkoff, and JD Hamilton, for the VA Cooperative Study Group on AIDS in the Annals of Internal Medicine in 1997, Issue 126, pages 939-45.
- DR Henrard worked with JF Phillips and LR Muenz and other researchers developed a study on the natural history of cell-free viremia. Their study was published in 1995 in the Journal of the American Medical Association. It appeared in issue 274 on pages 554-558.

Solution to Learn

Compare your work with the article as it was published:

This document was taken from the HIV InSite, (http://hivinsite.ucsf.edu/) an information site on HIV sponsored by various organizations. The article is no longer online.

Natural History and Monitoring of HIV RNA in Children

Viral burden in the peripheral blood can be determined using quantitative HIV RNA assays. During primary infection in adults, there is an initial rise in HIV RNA copy number to very high peak levels. Coincident with the body's humoural and cell mediated immune response there is a sharp decline in RNA levels by as much as two to three log copies to reach a stable lower level 10 ("virologic set-point") approximately six to 12 months following acute infection, reflecting the balance between ongoing viral production and immune elimination.(Katzenstein 96, Henrard 95) Several studies in adults have shown that infected individuals with lower HIV copy number at the time of RNA stabilization have slower progression and improved survival compared to those with high HIV RNA set points.(Mellors 95, Clementi 96) Based on such data, recommendations for use of HIV RNA copy number in deciding to initiate and change antiretroviral therapy in infected adults have been made (Panel 97); these recommendations are also applicable to infected adolescents, particularly those adolescents who have acquired HIV infection via drug use and/or sexual contact. Many Working Group members also believe that these recommendations are applicable to perinatally-infected children older than three years of age.

The HIV RNA pattern among perinatally-infected infants differs from that seen in infected adults. Very high HIV RNA copy numbers appear to persist among infected children for prolonged periods. (Palumbo 95, Abrams 96) In one large prospective study, HIV RNA levels were generally low at birth (<10,000 copies/mL), rose to extremely high values within the first two months of life (most infants had values >100,000 copies/mL, ranging from undetectable in rare infants to nearly 10 million copies/mL), and then fell very slowly; the mean HIV RNA level during the first year of life was 185,000 copies/mL. (Shearer 97) Additionally, in contrast to the adult pattern, after the first year of life, HIV RNA copy number only slowly declines over the next few years of life. (McIntosh 96, Shearer 97, Mofenson 97, Palumbo 97) This pattern likely reflects the lower efficiency of an immature but developing immune system in containing viral replication, and possibly a greater number of HIV-susceptible cells in the infant.

Recent data indicate that very high HIV RNA levels in infants under 12 months of age (over 300,000 copies/mL) may be correlated with disease progression and death;

however, there was considerable overlap in RNA levels between rapid and non-rapid progressors. (Shearer 97, Abrams 96) High RNA levels (above 100,000 copies/mL) in young infants have also been shown to be associated with high risk for disease progression and mortality, particularly if the CD4+ lymphocyte percentage is under 15%. (Mofenson 97, Palumbo 97) (Tables 4-6) Similar findings have been reported in a preliminary analysis of data from pediatric clinical trial PACTG 152 correlating baseline virologic data with risk of disease progression or death during study follow-up. (Table 6) (Palumbo 97) In this study, there was a 54% reduction in the relative risk of progression for each one log decrease in baseline HIV RNA level. Disease progression was 10 documented in 11% of children 30 months old or less at entry (mean age, 1.1 years) with baseline RNA in the lowest quartile (undetectable to 150,000 copies/mL) compared to 52% of those with baseline RNA in the highest quartile (>1,700,000 copies/mL). (Palumbo 97) Among children over 30 months old at entry (mean age, 7.3 years), none of those with baseline RNA in the lowest quartile (undetectable to 15,000 copies/mL) compared to 34% of those in the highest quartile (>150,000 copies/mL) had progression; children with RNA levels in the middle two quartiles (15,000 to 50,000 and 50,000 to 150,000 copies/mL) had similar progression rates (13% and 16%, respectively). The data from children over 30 months of age are similar to data from studies among infected adults, where the risk of disease progression dramatically increases when HIV RNA levels exceed 10,000 to 20,000 copies/mL. (Panel Rec 97)

Despite these data, the predictive value of specific HIV RNA levels for disease progression and death for an individual child is relatively poor. (Mofenson 97) HIV RNA levels may be particularly difficult to interpret during the first year of life because levels are extremely high and there is marked overlap in levels between rapid and non-rapid progressors. (Palumbo 95) Additional data indicate that baseline as well as changes in HIV RNA copy number and CD4+ lymphocyte percent over time each independently contribute to prediction of mortality risk in infected children, and the use of the two markers together may more accurately define prognosis. (Mofenson 97, Palumbo 97) Similar data and conclusions have recently been reported from several studies in infected adults.(Mellors 97, O'Brien 97, Hughes 97)