# The University of New Mexico

# College of Pharmacy

# PHARMACY 770

# DRUG INFORMATION ADVANCED PHARMACY PRACTICE EXPERIENCE

"IF THE WHOLE MATERICA MEDICA, AS NOW USED, COULD BE SUNK TO THE BOTTOM OF THE SEA, IT WOULD BE ALL THE BETTER FOR MANKIND, AND ALL THE WORSE FOR THE FISHES."
– OLIVER WENDELL HOLMES

I. Goal and Objectives.

A. Goal. The goal of drug information instruction is to prepare a student to serve as an effective provider of drug information. An effective provider perceives, assesses and evaluates drug information needs and retrieves, evaluates, communicates and applies data from the published literature and other sources as an integral component of pharmaceutical care.

This goal is achieved through the completion of didactic and experiential courses as well as direct patient care experiences. This APPE is one element in the preparation of a student to be an effective drug information provider.

B. Objectives. Upon completion of this APPE a student will be able to:

1. demonstrate effective written and verbal communication skills.
2. describe the types and functions of commonly available drug information resources.
3. demonstrate proficiency in the use of commonly available drug information resources.
4. use a systematic approach to resolve drug information problems.
5. demonstrate efficient literature search strategies.
6. critically analyze and evaluate biomedical literature.
7. interpret and combine information from multiple sources into a concise written or verbal presentation.
8. apply appropriate drug information to patient care situations, recognizing that more than one resolution might be applicable.
9. assess the drug information resources and needs of his/her practice setting(s) as well as of the health professionals and consumers he/she supports.

Achievement of these objectives will contribute to meeting the following expectations:

**UNM CoP Competencies**

16. Develop population-specific, evidence-based, and effective disease prevention and management programs.
18. Apply patient- and population-specific data, quality assurance strategies, and research processes to: assure that medication use systems minimize drug misadventuring, optimize patient outcomes, develop drug use and public health policy, design pharmacy benefits, and resolve public health problems.
19. Use appropriate scientific terminology to convey anatomical, pathophysiologic, physiologic, chemical, pharmacological, and therapeutic concepts.
20. Communicate and collaborate with patients, caregivers, prescribers, population members, other healthcare providers, and administrative and support personnel to engender a team approach to patient care and to assure efficient, cost-effective utilization of human, physical, medical, informational, and technological resources in the provision of pharmaceutical care as well as to identify and resolve medication use problems.
22. Evaluate the biomedical literature with regard to the pharmacokinetics and pharmacodynamics of drugs.
27. Retrieve, analyze, and interpret the professional and lay literature to provide drug information to patients, their families, as well as other healthcare providers and the public.
29. Maintain professional competence by identifying and analyzing emerging issues, products, and services that might:
    a. affect the efficacy or quality of disease prevention services.
    b. impact the management of human, physical, medical, informational, and technological resources in the provision of pharmaceutical care.
    c. impact patient-specific and population-based therapeutic outcomes.
30. Maintain professional competence in providing pharmaceutical care by becoming an independent, lifelong learner.

**ACPE Guideline 12.1**

To be capable of the above [to practice pharmacy independently at the time of graduation], pharmacy graduates also must be able to:

- retrieve, analyze, and interpret the professional, lay, and scientific literature to provide drug information and counseling to patients, their families or care givers, and other involved health care providers.
- demonstrate expertise in informatics.[1]

**ACPE Appendix B. Additional Guidance on the Science Foundation for the Curriculum**

Biostatistics

- evaluation of statistical results
- understanding of statistical versus clinical significance

Pharmacoepidemiology

- studies that provide an estimate of the probability of beneficial effects in populations, or the probability of adverse effects in populations, and other parameters relating to drug use benefit

[1] Competencies in informatics include basic terminology (data, information, knowledge, hardware, software, networks, information systems, information systems management); reasons for systematic processing of data, information and knowledge in health care; and the benefits and current constraints in using information and communication technology in health care. *(Adapted from recommendations of the International Medical Informatics Association)*

Drug Information
- fundamentals of the practice of drug information
- application of drug information skills for delivery of pharmaceutical care
- technology of drug information retrieval for quality assurance
- the ability to judge the reliability of various sources of information

Literature Evaluation and Research Design
- fundamentals of research design and methodology
- principles of evaluation of the primary literature
- practical implications of the primary literature
- principles of research design and analysis in practicing evidence-based pharmacy

II. Faculty.

A. William G. Troutman, Pharm.D., (272-1164, wtroutman@salud.unm.edu).

B. Leslie A. McCament-Mann, Ph.D., (272-4261, lmccament-mann@salud.unm.edu).

III. Description of Activities.

A. Readings and group discussions. The required text for this APPE is: Gehlbach SH. Interpreting the medical literature. 5th ed. New York: McGraw Hill; 2006. Additional readings are posted on the course's e-reserve site. Reading assignments will be made several days in advance of the group discussion covering the material (see appendix A for complete reading list). During a group discussion, students will be expected to have read all of the assigned materials and to be prepared to serve as a discussion leader for the topic (see below). Each student will be evaluated for each discussion session with 2 points = meaningful contribution to the discussion, 1 point = present but less than full participation, and 0 points = absent or no contribution.

1. As discussion leader, it is the student's job to:
   a) identify the important concepts presented in the required reading.
   b) determine if all members of the group understand and can apply these important concepts.
   c) ask questions of the group.
   d) ask open-ended questions of individual members of the group.
   e) ask for examples other than those described in the reading.
   f) identify areas of group weakness and form questions for the faculty.

2. As discussion leader, it is <u>not</u> the student's job to:
   a) lecture to the group.
   b) summarize the reading.
   c) answer all of the questions.

B. Drug information questions. Students will receive and respond to drug information requests from health professionals and the public in the NMPDIC call center. Each student will sign up for five

2-hour blocks per week. No more than two students can sign up for the same 2-hour time block. The student-developed schedule will be posted on at least a weekly basis. While in the call center, students will be under the direct supervision of the pharmacist Specialists in Poison Information (SPIs) on duty at NMPDIC and will not provide any responses until they are approved by a supervising SPI. All questions, responses, and recommendations will be documented using the Toxicall® system. All responses will be the result of the student's most complete effort at resolving the inquiry. All calls will be recorded and one call each week will be randomly selected and evaluated. The evaluation of this part of the APPE is presented in appendix B.

C. Drug information projects. Each student will complete two drug information projects. All presentations and papers will be due at the times announced by Dr. Troutman. Late written or verbal presentations will be penalized by a 10% reduction in base score per late day (e.g., a verbal presentation that would receive a score of 26 if presented on time will receive a score of 23 if presented 1 day late [4 points lost subtracted from 27 points instead of 30]).

1. The first project will focus on an adverse drug event. Each student will prepare fully referenced written and verbal presentations regarding a selected ADE.
    a) The student will conduct a thorough search of the biomedical information available at the University of New Mexico libraries and other campus resources to gather information on the selected ADE.
    b) Whenever possible, the student will utilize original information sources rather than abstracts, summaries, narrative reviews, or secondary citations.
    c) The student will carefully evaluate the literature and will base the written and verbal presentations on the best available studies. Emphasis should be placed on practical information such as the epidemiology, detection, assessment, management, and avoidance of an ADE.
    d) Verbal presentations will not exceed 15 minutes in length. The presenting student will provide referenced, 1- or 2-page, outline-style handouts of the presentation for all in attendance.
    e) The evaluation criteria for the verbal and written presentations are presented in appendices C and D.

2. Within the first week of the APPE, each student will identify a drug information topic he/she wishes to research and evaluate. The topic will be described in a manner that contains the four components of an answerable question: patient problem, intervention, comparison, and outcome. The topic cannot be one that the student has researched or presented before, cannot be one that has been previously presented by another student during their drug information APPE, and must be approved by Dr. Troutman. The topic will be presented as a fully referenced written paper and as a verbal presentation following the guidelines presented in this syllabus.

3. Question regarding style can be answered by consulting: American Medical Association manual of style: a guide for authors and editors. 10th ed. New York: Oxford University Press; 2007. All reference citations will be numbered consecutively in the order of their appearance in the manuscript and, once numbered, a reference will continue to be cited by that number throughout the manuscript. Reference style will conform to the style recommended by the International Committee of Medical Journal Editors (appendix E).

D. All written projects will be prepared using the formatted template that will be provided.

1. The paper will not exceed 7 pages in length (excluding references and search strategy).

2. It will be printed on white, 8½×11-inch paper.

3. A description of the search strategy, including search terms and results, will accompany each written project report as a separate document.

E. This APPE will be conducted in accordance with the UNM College of Pharmacy Course Policies and Procedures as posted on the College website. Specifically, this refers to the policies and for: Academic Dishonesty, Disabled Students, Grade Remediation, and Grade Reconsideration Requests.

F. Confidentiality and academic integrity. The activities of this APPE will expose students to patient-specific information through cases handled by students and through the regular work of the NMPDIC being conducted while students are present. This information is confidential. All written work submitted by students will be their own work. Any plagiarism, breach of confidentiality, or other unprofessional behavior will be grounds for immediate disciplinary action consistent with the UNM and College of Pharmacy Student Codes of Conduct.

IV. Grading. Student performance scores are available at any time and will be calculated according to the following plan (284 points total):

| | |
|---|---|
| Discussion sessions | 36 points (2 points/session) |
| Call responses | 68 points (17 points/call) |
| ADR project | 90 points (30 verbal and 60 written) |
| Drug information project | 90 points (30 verbal and 60 written) |

Assignment of final grades will follow to the following plan:

A = ≥90% of available points (≥255 points)
B = ≥80%<90% (227-254 points)
C = ≥70%<80% (198-226 points)
D = ≥60%<70 (170-197 points)
F = <60% (<170 points)

# APPENDIX A – SCHEDULE AND ASSIGNED READING

| date | topic | text | other reading |
|---|---|---|---|
| | Orientation<br>Info. source: Micromedex | | |
| | Tertiary information resources and exercises | | "Useful Resources for Commonly Requested Drug Information" |
| | MEDLINE via PubMed | ch. 1, 2 | |
| | Authorship and plagiarism<br>Info. source: International Pharmaceutical Abstracts | none | International Committee of Medical Journal Editors. Uniform requirements for manuscripts submitted to biomedical journals: writing and editing for biomedical publication. Oct 2004. **(pg 1-10, through sect. III.I.)**<br>Wren JD, Kozak KZ, Johnson KR, Deakyne SJ, Schilling LM, Dellavalle RP. The write position. A survey of perceived contributions to papers based on byline position and the number of authors. EMBO Rep. 2007;8:988-91.<br>Julliard K. Perceptions of plagiarism in the use of other authors' language. Fam Med. 1994;26:356-60. |
| | Causality, case reports, case series<br>Info. source: Web of Science cited search | ch. 12 & 247-58 | "Causality Algorithms"<br>Kelly WN, Arellano FM, Barnes J, Bergman U, Edwards IR, Fernandez AM, et al. Guidelines for submitting adverse event reports for publication. Drug Saf. 2007;30:367-73.<br>Dodd MA, Dole EJ, Troutman WG, Bennahum DA. Minocycline-associated tooth staining. Ann Pharmacother. 1998;32:887-9.<br>Benson BE, Mathiason M, Dahl B, Smith K, Foley MM, Easom LAJ, et al. Toxicities and outcomes associated with nefazodone poisoning: an analysis of 1,338 exposures. Am J Emerg Med. 2000;18:587-92. |
| | Case-control studies | ch. 3 | Schultz KF, Grimes DA. Case-control studies: research in reverse. Lancet. 2002;359:431-4.<br>Meier CR, Derby LE, Jick SS, Vasilakis C, Jick H. Antibiotics and risk of subsequent first-time acute myocardial infarction. JAMA. 1999;281:427-31. |
| | Cross-sectional studies | 55-69 | Levin KA. Study design III: Cross-sectional studies. Evid Based Dent. 2006;7:24-5.<br>Sexton M, Althius MD, Santanello N, Hyndman S, Williams R, Schmeidler D. Sex differences in the use of asthma drugs: cross sectional study. BMJ. 1998;317:1434-7. |
| | Cohort and before-after studies | 69-78 | Grimes DA, Schultz KF. Cohort studies: marching towards outcomes. Lancet. 2002;359:341-5.<br>Thapa PB, Gideon P, Cost TW, Milam AB, Ray WA. Antidepressants and the risk of falls among nursing home residents. N Engl J Med. 1998;339:875-82.<br>A primer on before-after studies: evaluating a report of a "successful" intervention. Eff Clin Pract. 2002;5:100-1. |
| | Patient selection in clinical trials<br>Info. source: clinicaltrials.gov | 79-88 | Cunny KA, Miller HW. Participation in clinical drug studies: motivations and barriers. Clin Therap. 1994;16:273-82.<br>Patient refusers, nonqualifiers, dropouts, dropins, and discontinuers. In: Spilker B. Guide to clinical trials. New York: Raven Press; 1991. p. 235-41. |

| | | | |
|---|---|---|---|
| | | | Pablos-Méndez A, Barr RG, Shea S. Run-in periods in randomized trials. Implications for the application of results in clinical practice. JAMA. 1998;279:222-5. |
| | Clinical trials | 88-110 | Randomized clinical trials. In: Riegelman RK. Studying a study and testing a test: how to read the medical evidence. 5th ed. Philadelphia; Lippincott Williams & Wilkins: 2005. p. 67-88.<br>Schulz KF, Altman D, Moher D. CONSORT 2010 statement: updated guidelines for reporting parallel group randomized trials. Ann Intern Med. 2010;152:726-32. |
| | Noninferiority studies | | Dasgupta A, Lawson KA, Wilson JP. Evaluating equivalence and noninferiority trials. Am J Health Syst Pharm. 2011;67:1337-43.<br>Schulman S, Parpla S, Stewart C, Rudd-Scott L, Julian JA. Warfarin dose assessment every 4 weeks versus every 12 weeks in patients with stable international normalized ratios: a randomized trial. Ann Intern Med. 2011;155:653-9. |
| | Cross-over studies | none | Selection from: Spilker B. Guide to clinical trials. New York: Raven Press; 1991.<br>Cleare AJ, Heap E, Malhi GS, Wessely S, O'Keane V, Miell J. Low-dose hydrocortisone in chronic fatigue syndrome: a randomised crossover trial. Lancet. 1999;353:455-8. |
| | Interpretation of results | ch. 6-8 | Rao G. Interpretation of confidence intervals. J Fam Pract. 2003;52:970. |
| | Risk and harm | none | Ross JF. Risk: where do real dangers lie? Smithsonian. 1997 Nov;26:42-53.<br>Barratt A, Wyer PC, Hatala R, McGinn T, Dans AL, Keitz S, et al. Tips for learners of evidence-based medicine: 1. Relative risk reduction, absolute risk reduction and number needed to treat. CMAJ. 2004;171:353-8. |
| | Narrative and systematic reviews<br>Info. sources: Cochrane Database of Systematic Reviews, DARE | 258-66 | Sauerland S, Seiler CM. Role of systematic reviews and meta-analysis in evidence-based medicine. World J Surg. 2005;29:582-7.<br>Zhang WY, Li Wan Po A. Efficacy of minor analgesics in primary dysmenorrhoea: a systematic review. Br J Obstet Gynæcol. 1998;105:780-9. |
| | Clinical practice guidelines<br>Info. source: National Guideline Clearinghouse | none | Shiffman RN, Shekelle P, Overhage JM, Slutsky J, Grimshaw J, Deshpande AM. Standardized reporting of clinical practice guidelines: a proposal from the Conference on Guideline Standardization. Ann Intern Med. 2003;139:493-8.<br>Manoguerra AS, Erdman AR, Booze LL, Christianson C, Wax PM, Scharman EJ, et al. Iron ingestion: an evidence-based consensus guideline for out-of-hospital management. Clin Toxicol (Phila). 2005;43:553-70. |
| | Sponsorship and advocacy | none | Wang T, McCoy CP, Murad MH, Montori VM. Association between industry affiliation and position on cardiovascular risk with rosiglitazone: cross sectional systematic review. BMJ. 2010;340:c1344.<br>Bodenheimer T. Uneasy alliance--clinical investigators and the pharmaceutical industry. N Engl J Med. 2000;342:1539-44.<br>Deyo RA, Psaty BM, Simon G, Wagner EH, Omenn GS. The messenger under attack--intimidation of researchers by special-interest groups. N Engl J Med. 1997;336;1176-80. |

# APPENDIX B

## DRUG INFORMATION RESPONSE

## SCORING SHEET

**History**

_____ Active listening – Did not need to ask for information twice. (1-0)

_____ Completeness – Obtained all essential information. (1-0)

**Researching Answer**

_____ Focus on primary literature – When appropriate, the primary literature was used to develop response instead of relying only on secondary or tertiary literature. (2-0)

**Written Documentation**

_____ Data coding – Case was properly coded according to NMPDIC guidelines. (1-0)

_____ Completeness – All essential information was included in inquiry write-up. (2-0)

_____ Referencing – Reference(s) were retrievable and appropriate. Citations were complete. (1-0)

_____ Accuracy – Response was correct. (2-0)

**Verbal Response**

_____ Completeness – All essential response information was communicated to client. (2-0)

_____ Organization – Response was structured with a logical flow of information. (1-0)

_____ Terminology – Information was communicated at an appropriate education level. (1-0)

_____ Timeliness – Complete response occurred within a reasonable time period. (1-0)

_____ Correlation to documentation – Verbal response correlated to written documentation. (1-0)

**Courtesy**

_____ Courtesy – Courteous to client throughout interaction. (1-0)

_____ TOTAL POINTS (17 points possible)

Case Number _____ student's name _____

evaluator _____

# APPENDIX C

## EVALUATION OF WRITTEN DRUG INFORMATION PROJECT

1. ____ Understanding of problem (7, 4, 0)
2. ____ Appropriate background information (7, 4, 0)
3. ____ References (7, 4, 0)
4. ____ Evaluation of available literature—technique (9, 4, 0)
5. ____ Evaluation of literature—interpretation of findings (7, 4, 0)
6. ____ Ability to reach a valid conclusion and resolve the problem (9, 4, 0)
7. ____ Organization of the written report (7, 4, 0)
8. ____ Writing technique (7, 4, 0)
9. ____ Search strategy (0, -1, -2)

_____ TOTAL POINTS (60 points possible)

comments:

student's name _____

evaluator _____

## WRITTEN DRUG INFORMATION PROJECT CRITERIA

1. Understanding of problem

| | | |
|---|---|---|
| Nature, scope, and importance of problem clearly presented and appreciated. (7 pts) | Nature, scope and importance of problem might be clear to writer but not clearly presented to reader. (4 pts) | Failed to define nature, scope or importance of problem or writer did not understand them. (0 pts) |

2. Appropriate background information

| | | |
|---|---|---|
| Background information was appropriate to the level of the student's peers; essential concepts were included with no unnecessary material added. (7 pts) | Background information was appropriate to the level of the student's peers but not completely presented or extraneous material was included. (4 pts) | Background information was not presented or was inappropriate for the level and needs of the student's peers. (0 pts) |

3. References

| | | |
|---|---|---|
| Paper was well referenced. Sources of all key information were clear. References were retrievable and in the required format. (7 pts) | Paper was referenced, but student failed to cite references consistently or references were not in required format. (4 pts) | There were many essential points for which references were not provided or the references were not retrievable. (0 pts) |

4. Evaluation of available literature: technique

| | | |
|---|---|---|
| Student evaluated studies in terms of experimental design, protocol, instruments of measurement, and handling of results. Student contrasted data from different studies and made comparisons in a logical manner. (9 pts) | Student evaluated literature but did a less than complete job or either ignored or did not attempt to account for conflicting reports. Student described more than evaluated studies. (4 pts) | Student failed to evaluate literature and simply presented results. Where conflicting data were reported, he/she did not attempt to analyze. (0 pts) |

5. Evaluation of literature: interpretation of findings

| | | |
|---|---|---|
| Student presented data and interpreted clinical significance of results as they related to the assignment. Student reported assessments of literature concisely and did not include nonessential information. (7 pts) | Student did not present relevant data or reported on assessments that were not essential to the problem or student's apparent understanding of clinical significance was incomplete. (4 pts) | Student was unable to pick out essential issues and formulate an assessment; included extraneous information or student failed to evaluate the literature. (0 pts) |

6. Ability to reach a valid conclusion and resolve the problem

| | | |
|---|---|---|
| Student was able to reach a valid conclusion based on and supported by a thorough evaluation of the available literature. Student reported this conclusion in a concise manner and made practical recommendations for resolution of problem. (9 pts) | Student did not reach a conclusion based on evaluation of literature or did not make practical recommendations for resolving the problem. (4 pts) | Student did not reach a conclusion and the problem was not resolved; the student's conclusion was not based on the data presented and the resolution was impractical. (0 pts) |

7. Organization of the paper

| | | |
|---|---|---|
| The paper was organized in a logical fashion proceeding from clear definition of the problem through presentation and interpretation of the available literature to conclusions and recommendations. (7 pts) | The paper was somewhat organized but had sections misplaced. (4 pts) | The paper was highly disorganized and hard to follow; bounced around from one area to another. (0 pts) |

8. Writing technique

| | | |
|---|---|---|
| The paper was well written; it showed correct spelling, punctuation and grammar. It was concise but included all essential information. (7 pts) | Paper contained errors in spelling, punctuation, or grammar or lacked expected conciseness to the point of being annoying. (4 pts) | Quality of written work was poor enough to interfere with reading. Included multiple errors in spelling, punctuation and grammar. (0 pts) |

8. Search strategy

| | | |
|---|---|---|
| The search was described in sufficient detail that one could reproduce the search. The steps were logical and complete. (0 pts) | The search was incompletely described or haphazard or incomplete. (-1 pt) | Search strategy was not submitted. (-2 pts) |

# APPENDIX D

## EVALUATION OF VERBAL DRUG INFORMATION PROJECT

1. ____ Understanding of problem (4, 2, 0)

2. ____ Background information (4, 2, 0)

3. ____ Evaluation of available literature (6, 3, 0)

4. ____ Organization (4, 2, 0)

5. ____ Ability to reach a valid conclusion and resolve the problem (6, 3, 0)

6. ____ Presentation technique (4, 2, 0)

7. ____ Timing (2, 1, 0)

_____ TOTAL POINTS (30 points possible)

comments:

student's name _____

evaluator _____

# VERBAL DRUG INFORMATION PROJECT CRITERIA

## 1. Understanding of problem

| | | |
|---|---|---|
| Nature, scope, and importance of problem were clearly defined and presented. (4 pts) | Nature, scope and importance of problem might be clear to presenter but not clearly presented to audience. (2 pts) | Failed to define nature, scope or importance of problem or presenter did not understand them. (0 pts) |

## 2. Background information

| | | |
|---|---|---|
| Background information was appropriate for the audience; essential concepts were included with no unnecessary material added. (4 pts) | Background information was appropriate for the audience but not completely presented or extraneous material was included. (2 pts) | Background information was not presented or was inappropriate for the level and needs of the audience. (0 pts) |

## 3. Evaluation of available literature

| | | |
|---|---|---|
| Available literature on problem was described, results reported, and assessments of the quality of the literature were presented. (6 pts) | Available literature on problem was described, but student just reported results of studies with only minimal evaluation. (3 pts) | Student did describe available literature or did not comment on findings. (0 pts) |

## 4. Organization

| | | |
|---|---|---|
| Presentation was organized in logical fashion, was easy to follow, and flowed smoothly from definition of problem through background information and assessment of available literature to conclusion. (4 pts) | Presentation was somewhat organized, but student tended to skip from one subject area to another. However, most essential features were presented. (2 pts) | Presentation was highly disorganized and almost impossible to follow. It left doubt in the audience's mind as to the nature of the problem and conclusions. (0 pts) |

## 5. Ability to reach a valid conclusion and resolve the problem

| | | |
|---|---|---|
| Student was able to reach a valid conclusion based on and supported by a thorough evaluation of the available literature. Student reported this conclusion in a concise manner and made practical recommendations for resolution of problem. (6 pts) | Student did not reach conclusion based on evaluation of literature or did not make practical recommendations for resolving the problem. (3 pts) | Student did not reach a conclusion and the problem was not resolved; the student's conclusion was not based on the data presented and the resolution was impractical. (0 pts) |

## 6. Presentation technique

| | | |
|---|---|---|
| Student appeared confident, could be heard and understood, used changes in voice tone to emphasize importance, was a convincing presenter. (4 pts) | Student failed to meet one of the expectations for full credit. (2 pts) | Student failed to meet two or more of the expectations for full credit. (0 pts) |

## 7. Timing

| | | |
|---|---|---|
| Student completed presentation within the specified time. (2 pts) | Student exceeded time limit by ≤2 minutes (1 pt) | Student exceeded time limit by >2 min. (0 pts) |

# APPENDIX E

# REFERENCE CITATION FORMATS

**Journal Articles**

Standard journal article – List the first six authors followed by et al.

Halpern SD, Ubel PA, Caplan AL. Solid-organ transplantation in HIV-infected patients. N Engl J Med. 2002 Jul 25;347(4):284-7.

As an option, if a journal carries continuous pagination throughout a volume (as many medical journals do) the month and issue number may be omitted.

Halpern SD, Ubel PA, Caplan AL. Solid-organ transplantation in HIV-infected patients. N Engl J Med. 2002;347:284-7.

More than six authors

Rose ME, Huerbin MB, Melick J, Marion DW, Palmer AM, Schiding JK, et al. Regulation of interstitial excitatory amino acid concentrations after cortical contusion injury. Brain Res. 2002;935(1-2):40-6.

Organization as author

Diabetes Prevention Program Research Group. Hypertension, insulin, and proinsulin in participants with impaired glucose tolerance. Hypertension. 2002;40(5):679-86.

No author given

21st century heart solution may have a sting in the tail. BMJ. 2002;325(7357):184.

Volume with supplement

Geraud G, Spierings EL, Keywood C. Tolerability and safety of frovatriptan with short- and long-term use for treatment of migraine and in comparison with sumatriptan. Headache. 2002;42 Suppl 2:S93-9.

Issue with supplement

Glauser TA. Integrating clinical trial data into clinical practice. Neurology. 2002;58(12 Suppl 7):S6-12.

Volume with part

Abend SM, Kulish N. The psychoanalytic method from an epistemological viewpoint. Int J Psychoanal. 2002;83(Pt 2):491-5.

Issue with part

Ahrar K, Madoff DC, Gupta S, Wallace MJ, Price RE, Wright KC. Development of a large animal model for lung tumors. J Vasc Interv Radiol. 2002;13(9 Pt 1):923-8.

Issue with no volume

Banit DM, Kaufer H, Hartford JM. Intraoperative frozen section analysis in revision total joint arthroplasty. Clin Orthop. 2002;(401):230-8.

No volume or issue

Outreach: bringing HIV-positive individuals into care. HRSA Careaction. 2002 Jun:1-6.

Type of article indicated as needed

Tor M, Turker H. International approaches to the prescription of long-term oxygen therapy [letter]. Eur Respir J. 2002;20(1):242.

Lofwall MR, Strain EC, Brooner RK, Kindbom KA, Bigelow GE. Characteristics of older methadone maintenance (MM) patients [abstract]. Drug Alcohol Depend. 2002;66 Suppl 1:S105.

Article published electronically ahead of the print version

Yu WM, Hawley TS, Hawley RG, Qu CK. Immortalization of yolk sac-derived precursor cells. Blood. 2002 Nov 15;100(10):3828-31. Epub 2002 Jul 5.

**Books and Other Monographs**

Personal author(s)

Murray PR, Rosenthal KS, Kobayashi GS, Pfaller MA. Medical microbiology. 4th ed. St. Louis: Mosby; 2002.

Editor(s), compiler(s) as author

Gilstrap LC 3rd, Cunningham FG, VanDorsten JP, editors. Operative obstetrics. 2nd ed. New York: McGraw-Hill; 2002.

Organization(s) as author

Royal Adelaide Hospital; University of Adelaide, Department of Clinical Nursing. Compendium of nursing research and practice development, 1999-2000. Adelaide (Australia): Adelaide University; 2001.

Chapter in a book

Meltzer PS, Kallioniemi A, Trent JM. Chromosome alterations in human solid tumors. In: Vogelstein B, Kinzler KW, editors. The genetic basis of human cancer. New York: McGraw-Hill; 2002. p. 93-113.

Dictionary and similar references

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

**Electronic Material**

CD-ROM

Anderson SC, Poulsen KB. Anderson's electronic atlas of hematology [CD-ROM]. Philadelphia: Lippincott Williams & Wilkins; 2002.

Journal article on the Internet

Abood S. Quality improvement initiative in nursing homes: the ANA acts in an advisory role. Am J Nurs [serial on the Internet]. 2002 Jun [cited 2002 Aug 12];102(6):[about 3 p.]. Available from: http://www.nursingworld.org/AJN/2002/june/Wawatch.htm

Monograph on the Internet

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