AOTA'S EVIDENCE EXCHANGE
CRITICALLY APPRAISED PAPER (CAP) GUIDELINES

AOTA INSPIRE Poster Submissions

Critically Appraised Papers (CAPs) are at-a-glance summaries of the methods, findings, study limitations, and clinical implications of selected quantitative intervention-based articles. Critically Appraised Paper presentations are intended to provide a detailed appraisal of an individual quantitative study to determine its value and relevance to occupational therapy practice.

Please submit your CAP through the AOTA INSPIRE Call for Papers. To prepare your CAP for submission, fill out the CAP Worksheet. Refer to this CAP Guidelines for submission criteria and detailed instructions on how to fill out each section of the worksheet.

When preparing the CAP, keep in mind that if accepted, you will present the final content as a poster presentation at AOTA INSPIRE; it is the expectation that the poster will only include information provided on the submitted CAP worksheet. The CAP Worksheet should be filled out with strict adherence to the character count limit indicated on the CAP Worksheet.

The following criteria must be considered prior to selecting an article for appraisal and development of a CAP:

- The article is an original **quantitative** study that describes an intervention within the scope of occupational therapy practice. The intervention and/or outcome measures must be occupation- or activity-based. Please note that systematic reviews, meta-analyses, and qualitative studies will not be accepted.
- The article was published in a peer-reviewed journal within **5 years of the date of submission**.
- The article is Level I (limited to randomized controlled trials), II, or III evidence. Only quantitative intervention studies will be considered. CAPs submitted on qualitative studies, mixed-method studies, systematic reviews, meta-analyses, descriptive studies, single-subject design, case reports, expert opinions, or assessment tools and measures will not be accepted.

In addition, the following criteria must be met:

- The CAP must be filled out according to the most up-to-date CAP Worksheet.
- All sources must be appropriately paraphrased and cited. If plagiarism is identified, the CAP will be rejected.
- Direct quotes should be avoided. If needed, proper APA format must be used. Any CAP that contains uncited work will be rejected.
- Content should directly follow this CAP Guidelines and address the questions posted in the Guidelines.
- All acronyms must be spelled out when used for the first time.
- The CAP Worksheet must be previewed for errors in syntax and spelling.
- The DOI number for the original article must be provided in the Citation section. All submission must include an electronic version of the original article.
- Any additional articles referred to (cited) in the CAP need to be included on the Reference list (include DOI number) using APA format (7th edition).
- If you are a student submitting a CAP, a faculty advisor must provide support throughout the CAP development process, including reviewing all CAPs prior to submission. Only exemplary CAPs that have been completed with support of a faculty advisor should be submitted.

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CITATION AND DOI NUMBER

Using APA format (7th edition), include full title, all authors (last name, initials), full journal title, year, volume #, and page #s. Include the DOI number (Digital Object Identifier) for the original article. Numbers are often listed at the end of a reference in a reference list. An example citation:

> Simmons, C. D., Griswold, L. A., & Berg, B. (2010). Evaluation of social interaction in occupational engagement. *American Journal of Occupational Therapy, 64*(1), 10–17. http://dx.doi.org/10.5014/ajot.64.1.10

CLINICAL BOTTOM LINE

This section is critical to the readers and should include a brief description of the intervention in the study including its frequency, duration, and application to a specific setting and population. Discuss how the evidence can be used to inform and guide occupational therapy practice (i.e., occupation-based interventions within the scope of traditional or emerging practice) AND how practitioners can use the evidence relative to the target population and practice setting. Keep these points in mind as you are developing this section:

- Are the recommendations stated in practical terms (i.e., are they ready to be implemented?). Stating that the evidence has an "impact" or "effect" on practice is insufficient. Telling the reader how the evidence can be used is valuable.
- Do the limitations of the study affect the strength of the evidence (i.e., type of study design, level of evidence, identified study limitations, internal and external threats to the study)? Include implications identified by the author and any other limitations from the appraisal.
- Are the findings generalizable? Provide clear and specific recommendations as to how the findings may (or may not) be implemented in clinical practice, program development, education and training, and/or research. Please keep in mind that you are reviewing only one article, and therefore, the implications should reflect this single study only.

RESEARCH OBJECTIVE(S), DESIGN TYPE, AND LEVEL OF EVIDENCE

List the objective(s) of the study. The objectives are usually stated briefly in the abstract of the article, and again in more detail in the introduction. They may be phrased as a statement, "To evaluate or test the effectiveness of….". Please phrase in your own words. This should be no more than a brief sentence or two.

State specific type of study design from the article. While many research articles include the study design, some do not, and determining the design and level of evidence may not be clear-cut. Use the description of the study procedure to guide the decision on design and level of evidence. See Appendix for further explanation of study design types.

For purposes of the Evidence Exchange, submissions should be based on articles that are Level I (limited to randomized controlled trials), II, or III evidence. State the level of evidence using the following criteria (adapted from Sackett, D.L., Rosenberg, W.M., Muir Gray, J.A., Haynes, R.B. & Richardson, W.S. (1996). Evidence-based medicine: What it is and what it isn't. *British Medical Journal, 312,* 71-72):

Level I:	**Randomized controlled trials**
Level II:	**Two groups, nonrandomized studies (e.g., cohort, case-control)**
Level III:	**One group, nonrandomized (e.g., before-and-after, pretest and posttest)**

PARTICIPANT SELECTION

How were participants selected to participate? Describe sample selection procedures.

Inclusion criteria: What criteria did the researchers use to select participants (e.g., diagnosis, severity level, age)?

Exclusion criteria: What criteria did the researchers use to limit the study population (e.g., severity level, age)?

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INTERVENTION(S) AND CONTROL GROUPS *(completed for each study group)*

Brief description of the intervention: Provide a brief description of the intervention(s) including the location of the study. It must answer the "what?" and "how?" of the intervention.

How many participants in the group?

Where did the intervention(s) take place? Was intervention(s) received at home or in an institution? Was it the same for different groups of subjects if there was more than one intervention group?

Who delivered? Who provided the intervention(s)? Was it different for intervention and control groups?

How often? How often did the intervention(s) take place and what was the length of the individual intervention session (e.g., twice weekly for 30 minutes per session)?

For how long? How long did the intervention(s) last (e.g., 3 months)

OUTCOME MEASURES

Outcomes are the variables or issues of interest to the researcher(s). They represent the product or results of the intervention or exposure. Many studies include numerous outcome measures. For the purpose of the CAP, **only** include measures relevant to occupational therapy practice. Complete the following for each measure:

Name of test/measure and what outcome was measured: Example: McGill Pain Questionnaire (pain intensity and pain perception)

Is the measure reliable (as reported in the article)? Reliability refers to whether a measure provided the same information over different situations. The two most common forms of reliability are (1) test–retest reliability—the same observer gets the same information on two occasions separated by a short time interval, and (2) interrater reliability—different observers get the same information at the same time.

Is the measure valid (as reported in the article)? Validity asks whether the measure assesses what it is intended to measure. Consider if the measure includes all of the relevant concepts and elements of the outcome (content validity) and if the authors report that the measure has been tested in relationship to other measures to determine any relationship (criterion validity). For example, a "valid" ADL measure includes all relevant elements of self-care and has been tested with other measures of daily living activities and self-care functioning to determine that the relationship between the measures is as expected.

When was the measure used? It is important to note if the outcome was measured pre- and post-intervention, and whether short-term and/or long-term effects were considered.

RESULTS

List key findings based on study objectives. Key findings should include change (or lack of change) in outcomes relevant to occupational therapy practice and comparability of groups (as appropriate). Include statistical significance where appropriate ($p > .05$) and effect size if reported.

LIMITATIONS

As applicable, identify any of the following biases and limitations:

Measurement biases

When evaluating measurement biases inherent in the study, you can consider reporting on the outcome measures as a group, taking into account each outcome measure.

Were the evaluators blind to treatment status? Evaluators who are aware of which group a participant was allocated to or which intervention a participant received can influence the results by giving the participant, or group of participants, a more or less favorable evaluation. It is usually the intervention group that is favored. This should be considered when the evaluator was part of the research or intervention team.

Was there recall or memory bias? This can be a problem if outcomes were measured using self-report tools, surveys, or interviews that require the participant to recall past events. Often a person recalls fond or positive memories more than negative ones, which can favor the results of the study.

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Intervention biases

Contamination: This occurs when participants of the control group inadvertently received the intervention; thus, the difference in outcomes between the two groups may be reduced. This favors the control group.

Co-intervention: Participants receiving another form of intervention at the same time as the study intervention can influence the results in either direction. For example, taking medication while receiving or not receiving intervention could favor the results for participants in either group. The reader must consider if the other, or additional, intervention could have positively or negatively influenced the results.

Timing of intervention: Consider whether the intervention was provided over a short or extended period of time. For example:

- If the intervention was provided over an extended period of time, aging can be considered a timing factor.
- In the case of children, maturation alone could be a factor in improvements seen.
- If the intervention was very short in duration, there may not have been sufficient time for a noticeable effect in the outcomes of interest. This would favor the control group.

Site of intervention: Where an intervention took place can influence the results. For example, an intervention program carried out in a person's home may result in a higher level of satisfaction that favors the intervention group. The site of intervention should be consistent among all groups.

Use of different therapists to provide intervention: If different therapists were involved in providing the intervention(s) under study to the different groups of participants, the results could be influenced in one direction. For example, one therapist could be more motivating or positive than another; hence, the group that she worked with could demonstrate more favorable outcomes. Therapist involvement should be equal and consistent among all intervention groups.

Baseline equality: Intervention and control groups should be equal on important participant characteristics (e.g., age, gender, severity of disability) and outcome measures (dependent variables) at study outset. If not, differences should be dealt with appropriately in data analysis.

Additional limitations

Was this study adequately powered (large enough to show a difference?) While a *p*-value that is greater than .05 indicates that there is no statistically significant difference between groups, in some research studies no difference is noted because the sample size is small. In this situation, one surmises that if the groups had been larger, there would be a statistically significant difference.

Were the analysis methods appropriate? Did the authors justify/explain their choice of analysis methods? Do they appear to be appropriate for the study and the outcomes? You need to consider the following:

- The purpose of the study—Is it comparing two or more interventions or examining the correlation between different variables of interest? Different statistical tests are used for comparison and correlation.
- The outcomes—If there is only one outcome measured that compares two different interventions, a simple statistical test (e.g., a *t*-test) will probably be sufficient. However, with a larger number of outcomes involving different types of variables, more complex statistical methods, such as analysis of variance (ANOVA) or regression analysis, are usually required.

Were statistics appropriately reported? Refer to narrative in article as well as tables.

Was participant dropout less than 20% in total sample and balanced between groups? If dropout was greater than 20% and there was an imbalance between groups, attrition may be a concern. Consider reasons for attrition if reported by researchers.

CONCLUSION

The discussion section of the article should outline clear conclusions from the results. As you are developing this section, consider the following:

- Conclusions should be relevant and appropriate, given the study methods and results. For example, the researchers of a well-designed RCT study using sound outcome measures could state that the results are conclusive that intervention A is more effective than intervention B for the study population.

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- Strong conclusions cannot always be made. For example, studies with methodological limitations or biases (e.g., lack of a control group, unreliable measures) make it difficult to "prove" or conclude that it was the intervention alone that influenced the outcome(s). In these situations, the authors may only conclude that the results demonstrated a difference in the specific outcomes measured in this study for the clients involved.
- The results may not be generalizable to other populations. Therefore, further study or research should be recommended.
- Determine if the study results address the study objectives (or hypotheses) by means of presenting the study outcomes and corresponding statistical analyses.
- Please note that this section is not a duplicate from the clinical bottom line. Information about how the evidence can be used to inform and guide occupational therapy practice should be included in the clinical bottom line section of the CAP.

Adapted from: Law, M. (2002). *Evidence-based rehabilitation: A guide to practice.* Thorofare, NJ: Slack.

APPENDIX: STUDY DESIGN TYPES AND ISSUES

DESIGN ISSUES

There are many different types of research designs. The most common types in rehabilitation research are included. The essential features of the different types of study designs are outlined to assist in determining which were used in the study you are reviewing. Some of the advantages and disadvantages of the different types of designs are outlined to assist in determining the appropriateness of the design for the study being reported.

DESIGN TYPES

For purposes of the Evidence Exchange, CAPs are to be submitted on articles with Level I (limited to randomized controlled trials only), II, or III evidence. Only quantitative intervention studies will be considered. CAPs submitted on qualitative studies, mixed-method studies, systematic reviews, meta-analyses, descriptive studies, single-subject design, case reports, expert opinions, or assessment tools and measures, will not be accepted into the Evidence Exchange.

Level I

Randomized Controlled Trial

- Randomized controlled trial or randomized clinical trial (also referred to as Experimental or Type 1 study); RCTs also encompass other methods, such as crossover designs.
- The essential feature of an RCT is that a set of clients/subjects are identified and then randomly allocated (assigned) to two or more different intervention "groups." One or more group of clients receives the intervention of interest (often a new intervention) and another group is the "control" group, which usually receives no intervention or standard practice. Random allocation to different intervention groups allows comparison of the client groups in terms of the outcomes of interest because randomization strongly increases the likelihood of similarity of clients in each group. Thus, the chance of another factor (known as a confounding variable or issue) influencing the outcomes is greatly reduced.
- The main disadvantage of RCTs is the expense involved, and in some situations it is not ethical to have "control" groups of clients who do not receive intervention. For example, if you were to study the effectiveness of a multidisciplinary inpatient program for post-surgical patients with chronic low back pain, it may be unethical to withhold intervention in order to have a control group.
- RCTs are often chosen when testing the effectiveness of an intervention, or to compare several different forms of intervention.

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Level II

Nonrandomized Controlled Design (also called Cohort Design)

A cohort is a group of people (clients) who share a common experience within a defined time period. Cohort designs are "prospective," meaning that the direction of time is always forward. Time flows forward from the point at which the clients are identified. They are sometimes referred to as prospective studies.

- Given the nature of the cohort studies, these studies often have a comparison ("control") group of clients/people who have not been exposed to the situation of interest (i.e., they have not received any intervention). One of the main differences between an RCT and a cohort study is that the allocation of people (clients) to the intervention and control groups is not under the control of the investigator in a cohort study. The investigator must work with the group of people who have been identified as "exposed" and then find another group of people who are similar in terms of age, gender, and other important factors.
- It is difficult to know if the groups are similar in terms of all the important (confounding) factors, and therefore, the authors cannot be certain that the intervention (exposure) itself is responsible for the outcomes.

Level III

Nonrandomized

Before-After Design (also known as Pretest and Posttest)

- Before-after design is usually used to evaluate a group of clients involved in an intervention.
- The evaluator collects information about the initial status of a group of clients in terms of the outcomes of interest and then collects information again about the outcomes after intervention is received.
- This is a useful design when you do not wish to withhold intervention from any clients. However, with no "control" group, it is impossible to judge if the intervention alone was responsible for any changes in the outcomes. Changes could be due to other factors such as disease progression, medication use, lifestyle, or environmental changes.

CAP Worksheet adapted from "Critical Review Form--Quantitative Studies." Copyright © 1998, by M. Law, D. Stewart, N. Pollack, L. Letts, J. Bosch, & M. Westmorland, McMaster University. Used with permission.

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