GUIDE FOR AUTHORS

PREPARING A MANUSCRIPT: INSTRUCTIONS FOR AUTHORS

Below you will find a fairly detailed description of how a paper to be submitted to Health Professions Education should look like. Attached to this document you will find a Sample Manuscript visualizing the look and feel of a manuscript to be submitted, with references to the formatting requirements detailed below.

1. General Format

1. All manuscripts can only be submitted electronically via Editorial Manager.
2. Manuscripts should be double-spaced and left-justified (this includes references).
3. Use consistently either British English or American English.
4. Use 12-point font size, Times New Roman.
5. Use 2.5 cm margins, and format for A4 paper.
6. Number all pages, starting with the title page.
7. Spell out all acronyms in full at first use.
8. Divide your article into clearly defined and numbered sections. Subsections should be numbered 1.1 (then 1.1.1, 1.1.2, ...), 1.2, etc. (the abstract is not included in section numbering). Use this numbering also for internal cross-referencing: do not just refer to “the text”. Any subsection may be given a brief heading. Each heading should appear on its own separate line.
9. Make headings as short as is feasible. Use a maximum of four-level headings.
10. Level 1: Centred, Boldface, Uppercase and Lowercase Heading; Level 2: Left-aligned, Boldface, Uppercase and Lowercase Heading; Level 3: Indented, boldface, lowercase heading with a period. Begin body text after the period; and Level 4: Indented, boldface, italicized, lowercase heading with a period. Begin body text after the period.
11. Follow internationally accepted rules and conventions: use the international system of units (SI). If other quantities are mentioned, give their equivalent in SI. Authors wishing to present a table of nomenclature should do so on the second page of their manuscript.
12. Present simple formulae in the line of normal text where possible and use the solidus (/) instead of a horizontal line for small fractional terms, e.g., X/Y. In principle, variables are to be presented in italics. Powers of e are often more conveniently denoted by exp. Number consecutively any equations that have to be displayed separately from the text (if referred to explicitly in the text).

2. Before main text

A. Title page
1. The first page of the manuscript is a title page containing the following information:
2. The manuscript’s full title. Centred, Boldface, Uppercase and Lowercase. The title must be concise and informative. Titles are often used in information-retrieval systems. Avoid abbreviations and formulae where possible;
3. An author byline that lists all authors’ full names and affiliations. Where the family name may be ambiguous (e.g., a double name), please indicate this clearly. Present the authors’ affiliation below the names.
4. One-sentence bio for each author (page 2 of the title page); list position(s) or title(s) and institutional affiliation(s);
5. Corresponding author. Clearly indicate who will handle correspondence at all stages of refereeing and publication, also post-publication. Ensure that telephone and fax numbers (with country and area code) are provided in addition to the e-mail address and the complete postal address. Contact details must be kept up to date by the corresponding author; and
6. Disclosures section. All articles published in Health Professions Education must include a structured disclosures section as part of the title page (page 2 of the title page). Each category should appear as a separate paragraph: Ethical approval: For manuscripts involving studies with human participants, either (1) state that ethical approval has been granted (or waived) and include the date and reference number; or (2) indicate “Not applicable.” Funding: List any external funding, including grant names or numbers, or indicate “None.” Other disclosures: List any potential conflicts of interests.

B. Abstract
1. The abstract appears on its own page, between the title page and the first page of the main text of the manuscript.
2. The abstract should be written in the past tense and in third person.
3. The maximum length of the abstract is 300 words.
4. The abstract must fully represent the scope of the manuscript and it cannot contain information that is not included in the main text as well.
5. Data and findings reported in the abstract must match those reported in the main text of the manuscript.
6. For research reports: abstracts must be structured as follows: (1) Purpose, (2) Method, (3) Results, and (4) Discussion.
7. For innovation reports: abstracts must be structured as follows: (1) Problem, (2) Approach, (3) Outcomes, (4) Next Steps.

C. Keywords
Authors are invited to submit keywords associated with their paper (max. 5). Place keywords in alphabetical order and separate with semicolon.

D. Abbreviations
Define abbreviations that are not standard in this field in a footnote to be placed on the first page of the article. Such abbreviations that are unavoidable in the abstract must be defined at their first mention there, as well as in the footnote. Ensure consistency of abbreviations throughout the article.

3. Main text

The following structure for the main text applies depending on the type of report. For research reports. Structure the body of the manuscript using the main headings (1) Introduction, (2) Method, (3) Results, and (4) Discussion OR (1) Introduction, (2) Method, (3) Results and Discussion, and (4) General Discussion. For articles. Create headings that are to the point and that will give readers a sense of the article’s organization. For innovation reports. Structure the body of the manuscript using the main-level headings (1) Problem, (2) Approach, (3) Outcomes, and (4) Next Steps.

A. Introduction
State the objectives of the work and provide an adequate background, avoiding a detailed literature survey or a summary of the results.

B. Methods
Provide sufficient detail to allow the work to be reproduced. Methods already published should be indicated by a reference: only relevant modifications should be described.

Software used: When describing statistical analyses in the Method section, the name and version of the software used must be stated and referenced.

C. Results
Results should be clear and concise. Use two decimal places for mean values. Report appropriate confidence intervals whenever possible. Report standard deviations in parentheses (mean (SD)).
Report actual $P$ values to two decimal places (e.g., $P = .01$), unless $P < .01$ or rounding to two places would make a particular value non-significant. In such cases, report the $P$ value to three decimal places. Report effect-size with $P$ value.

### Discussion

This should explore the significance of the results of the work, not repeat them. A combined Results and Discussion section is often appropriate. Avoid extensive citations and discussion of published literature. The main conclusions of the study may be presented in a short Conclusions section, which may stand alone or form a subsection of a Discussion or Results and Discussion section.

### After main text

#### Appendices

If there is more than one appendix, they should be identified as A, B, etc. Formulae and equations in appendices should be given separate numbering: Eq. (A.1), Eq. (A.2), etc.; in a subsequent appendix, Eq. (B.1) and so on. Similarly for tables and figures: Table A.1; Fig. A.1, etc.

#### Acknowledgements

Collate acknowledgements in a separate section at the end of the article before the references and do not, therefore, include them on the title page, as a footnote to the title or otherwise. List here those individuals who provided help during the research (e.g., providing language help, writing assistance or proof reading the article, etc.).

#### Footnotes

Footnotes should be used sparingly. Number them consecutively throughout the article, using superscript Arabic numbers. Many word processors build footnotes into the text, and this feature may be used. Should this not be the case, indicate the position of footnotes in the text and present the footnotes themselves separately at the end of the article. Do not include footnotes in the Reference list. If footnotes are used in a table, indicate each footnote in a table with a superscript lowercase letter.

### Artwork

Electronic artwork general points:

- Make sure you use uniform lettering and sizing of your original artwork.
- Save text in illustrations as “graphics” or enclose the font.
- Only use the following fonts in your illustrations: Arial, Courier, Times, Symbol.
- Number the illustrations according to their sequence in the text.
- Use a logical naming convention for your artwork files.
- Provide captions to illustrations separately.
- Produce images near to the desired size of the printed version.
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You are urged to visit this site; some excerpts from the detailed information are given here.

### Formats

Regardless of the application used, when your electronic artwork is finalised, please "save as" or convert the images to one of the following formats (note the resolution requirements for line drawings, halftones, and line/halftone combinations given below):

- EPS: Vector drawings. Embed the font or save the text as “graphics”.
- TIFF: colour or greyscale photographs (halftones): always use a minimum of 300 dpi.
- TIFF: Bitmapmed line drawings: use a minimum of 1000 dpi.
- TIFF: Combinations bitmapmed line/halftone (colour or greyscale): a minimum of 500 dpi is required.

If your electronic artwork is created in a Microsoft Office application (Word, PowerPoint, Excel) then please supply “as is”.

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- Supply files that are too low in resolution;
- Submit graphics that are disproportionately large for the content.

### Colour artwork

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Use figures only (1) when their information cannot easily be stated or summarized in the manuscript itself, and (2) when the figure helps to visualize an important finding. Up to 5 figures are permitted unless the editor-in-chief agrees to deviate from this guideline.

Figures should be two-dimensional; black-and-white or grey scale; and without gridlines or background shading. Both axes (if applicable) must be labelled. Ensure that each figure has a caption. Supply captions separately, not attached to the figure. A caption should comprise a brief title (not on the figure itself) and a description of the illustration. Keep text in the illustrations themselves to a minimum but explain all symbols and abbreviations used. A caption should make the figure sufficiently understandable independent of the manuscript text. All figures must be called out in the text and the position should be indicated in the text as “Place Figure about here.”

Note: Health Professions Education does not redraw or create figures. It is the author’s responsibility to provide high quality figures that are ready to publish and to make revisions as requested by staff editors during the review and editing processes.

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Use tables only (1) when information cannot easily be stated or summarized in the manuscript itself, and (2) when that information is of central concern (e.g. enables replication or verification of findings). Be sparing in the use of tables and ensure that the data presented in tables do not duplicate results described elsewhere in the article. Up to 5 tables are permitted unless the editor-in-chief agrees to deviate from this guideline. Tables must be created in Word using the table function. Tables created in Excel or informally created in Word with tabbing or spacing is not accepted. Table titles should make the table sufficiently understandable independent of the manuscript text. Typically, include type of data, number and type of respondents, place of study, year of study. Titles should be placed directly above the table. Columns should be clearly labelled and include unit of measurement. Number tables consecutively in accordance with their appearance in the text. Place footnotes to tables below the table body and indicate them with superscript lowercase letters. Avoid vertical rules. All tables must be called out in the text and the position should be indicated in the text as “Place Table about here.”

### References

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Please ensure that every reference cited in the text is also present in the reference list (and vice versa). Any references cited in the abstract must be given in full. Unpublished results and personal communications are not recommended in the reference list, but may be mentioned in the text. If these references are included in the reference list they should follow the standard reference style of the journal and should include
a substitution of the publication date with either “Unpublished results” or “Personal communication” Citation of a reference as “in press” implies that the item has been accepted for publication.

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As a minimum, the full URL should be given and the date when the reference was last accessed. Any further information, if known (DOI, author names, dates, reference to a source publication, etc.), should also be given. Web references can be listed separately (e.g., after the reference list) under a different heading if desired, or can be included in the reference list.

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D. Reference style
Authors are responsible for the accuracy and completeness of their references. The reference style of Health Professions Education mirrors the American Medical Association (AMA) style. (See: http://www.amamanualofstyle.com/view/10.1093/jama/9780195176339.001.0001/med-9780195176339). The list of references should be double-spaced and placed at the end of the manuscript. Number the references according to the order in which they are first cited in the manuscript (do not list alphabetically). Use superscript numerals in the body of the text to indicate the reference list numbers being cited.

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Reference to a journal publication:

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Reference to a chapter in an edited book:

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Journal names should be abbreviated according to Index Medicus journal abbreviations: http://www.nlm.nih.gov/tsd/serials/lji.html; List of title word abbreviations: http://www.issn.org/2-22661-LTWA-online.php; CAS (Chemical Abstracts Service): http://www.cas.org/sent.html. General note: If Health Professions Education invites a revision of or accepts a manuscript prepared according to the requirements, the author must then revise the manuscript to meet Health Professions Education’s specific requirements (e.g., reference style) as directed by a staff editor.

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The following list will be useful during the final checking of an article prior to sending it to the journal for review. Please consult this Guide for Authors for further details of any item.

Ensure that the following items are present:
- One Author designated as corresponding Author:
  ✓ E-mail address
  ✓ Full postal address
  ✓ Telephone and fax numbers
  ✓ All necessary files have been uploaded
  ✓ Keywords
  ✓ All figure captions
  ✓ All tables (including title, description, footnotes)
  ✓ Further considerations
  ✓ Manuscript has been “spellchecked” and “grammar-checked”
  ✓ References are in the correct format for this journal
  ✓ All references mentioned in the Reference list are cited in the text, and vice versa
  ✓ Permission has been obtained for use of copyrighted material from other sources (including the Web)
  ✓ Colour figures are clearly marked as being intended for colour reproduction on the Web (free of charge) and in print or to be reproduced in colour on the Web (free of charge) and in black-and-white in print
  ✓ If only colour on the Web is required, black and white versions of the figures are also supplied for printing purposes
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SAMPLE PAPER
to be used as illustration for the

Health Professions Education Author Publication Guidelines

Effect of Availability Bias and Reflective Reasoning on Diagnostic Accuracy Among Internal Medicine Residents

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Disclosure
Ethical approval: Ethical approval has been granted from the Erasmus MC Institutional Review Board for research involving human subjects (2 February 2009, EUR-IRB-020209-1)
Funding: None.
Other disclosure: None.
Abstract

Purpose. To investigate: (1) whether recent experience with clinical problems provokes availability bias (overestimation of the likelihood of a diagnosis based on the ease with which it comes to mind), resulting in diagnostic errors, and (2) whether reflection (structured re-analysis of the case findings) counteracts this bias.

Method. Experimental study conducted in 2009 at the Erasmus Medical Centre, Rotterdam, with 18 first-year and 18 second-year internal medicine residents. Participants first evaluated the diagnoses of 6 clinical cases (Phase 1). Subsequently, they diagnosed 8 different cases through non-analytical reasoning, 4 of which had findings similar to previously evaluated cases, but different diagnoses (Phase 2).

Results. There were no main effects, but there was a significant interaction effect between “years-of-training” and “recent experiences with similar problems”. Results consistent with an availability bias occurred for the second-year residents, with a frequency similar to those previously encountered (1.55; 95% CI, 0.36-2.73) on the other cases (2.19; 95% CI, 1.73-2.66). Diagnostic errors were frequently for Phase 2 cases they had previous experience with (mean frequency per resident, 1.44; 95% CI, 1.08-1.80; p < .04).

Discussion. When faced with cases similar to those previously encountered, second-year residents made fewer errors through non-analytical reasoning, and application of diagnostic reflection tended to improve diagnostic accuracy in both first- and second-year residents.

Keywords: Availability bias; Diagnostic accuracy; Non-analytical reasoning;
Expertise might play a role in bias. Experienced physicians tend to rely more on non-analytical (or System 1) reasoning based on pattern recognition to diagnose routine problems; this is a rapidly, largely unconscious diagnostic approach. Although effective and highly efficient in most cases, it might be more easily affected by biases. One way to counteract biases suggested by studies in psychology is to induce physicians to adopt more reflective (or analytical, also referred to as System 2) reasoning, which comprises careful, effortful consideration of findings in a case, or to combine non-analytical and analytical reasoning.

We therefore investigated whether availability bias occurs when physicians diagnose cases that have clinical manifestations similar to those of recently encountered cases, and, if so whether reflection could counteract this bias. Because non-analytical reasoning develops in association with clinical experience, we also investigated whether there would be a difference in the degree of bias between residents in the first and second year of the residency program. We hypothesized that (1) recent experience might result in an availability bias when physicians non-analytically reason about similar diseases; (2) more experienced residents would have developed reflective reasoning would counteract this bias and improve diagnostic accuracy.

2.1 Overview

This experiment consisted of 3 phases: Phase 1, exposure, required participants to evaluate 6 different cases. Phase 2, non-analytical diagnosis, required participants to diagnose 4 cases, 4 of which had clinical manifestations that were similar to cases encountered in Phase 1. This was expected to influence diagnostic accuracy. Phase 3, reflective diagnosis, required participants to reflect on the diagnosis of the 4 cases that could have been influenced by an availability bias in Phase 2. This was expected to overcome the bias and lead to more accurate diagnoses.

2.2 Participants

Thirty-six out of 42 eligible internal medicine residents (participation rate = 86%) from the Erasmus Medical Center, Faculty of Medicine, Erasmus University Rotterdam (mean age, 29.50 years; SD, 2.10) in their first (n = 18) or second (n = 18) year of the residency program volunteered to participate in this study. It took place during an educational meeting held in September 2009; the academic year starts in January for the majority of the residents. Participants did not receive any compensation or other incentives. The nonparticipants were either doing shifts or on holidays. The ethics review committee from the Department of Psychology, Erasmus University Rotterdam, provided approval for this study. Because the nature of the study prevented prior disclosure of its objectives, oral consent was obtained after informing participants about their tasks. Debriefing was provided later.

2.3 Materials

In total, 16 written clinical cases were used in this study (Table 1). Cases consisted of a brief description of a patient’s medical history, signs and symptoms, and tests results (example case in Appendix A). All cases were based on real patients with a confirmed diagnosis. They were prepared by experts in internal medicine and used in previous studies with internal medicine residents. The cases were presented to participants in a booklet (one for each phase), in a random sequence.

2.4 Procedure
In Phase 3, participants were asked to again diagnose the 4 cases from Phase 2 that could have been influenced by previous exposure to similar cases (Table 1). They followed instructions aimed at inducing reflective reasoning: (1) read the case; (2) write down the diagnosis previously given for the case; (3) list the findings in the case description that support this diagnosis; (4) list the findings that speak against this diagnosis; (5) list the findings that would be expected to be present if this diagnosis were true but that were not described in the case. Participants were subsequently asked to list alternative diagnoses assuming that the initial diagnosis generated for the case had proved to be incorrect, and to follow the same procedure (steps 3-5) for each alternative diagnosis. Finally, they were asked to draw a conclusion by ranking the diagnoses in order of likelihood and selecting their final diagnosis for the case.

2.5 Analysis

All cases had a confirmed diagnosis that was accepted as the reference for the accuracy of the diagnoses provided by the participants. Participants (and CG) independently assessed the diagnoses that they were provided. The diagnoses were scored as correct, incorrect, or partially correct, scored as 1, 0.5, or 0 points, respectively, whenever the core diagnosis was cited by the participant. The diagnosis was scored as incorrect whenever the core diagnosis was not mentioned by the participant, or whenever the core diagnosis was mentioned as a constituent of another diagnosis. For example, in the case in the Box, "celiac disease" was scored as partially correct.

3. Results

Table 1 presents the mean diagnostic accuracy scores obtained by first-year and second-year residents when cases were solved through non-analytical reasoning (Phase 2). The ANOVA showed no significant main effects, but there was a significant interaction effect between "years of training" and "recent experiences with similar cases" ($F(1, 34) = 10.35, \text{MSE} = .68, P = .003, \eta^2 = .23$). Mean scores for the second-year residents were consistent with an availability bias. They obtained significantly lower diagnostic scores on the cases similar to those encountered in Phase 1 than the other cases (on 0-4 scale, 1.55; 95% confidence interval [CI], 1.15-1.96 vs 2.19; 95% CI, 1.73-2.66; $P = .03$).

Among the 8 Phase 2 cases potentially similar to Phase 1, second-year residents more frequently gave the Phase 1 diagnosis when they had encountered the cases in Phase 1 compared with when they had not (mean frequency per resident, 1.44; 95% CI, 0.93 – 1.96; vs 0.72; 95% CI, 0.28 – 1.17; $P = .04$). See Figure 1. Even when the participants had not encountered the similar cases in Phase 1, they sometimes incorrectly provided the Phase 1 diagnosis to the related cases, but this occurred less frequently than when they had been previously exposed to the Phase 1 cases.

In contrast, this pattern was not seen for the first-year residents, who had a higher score on the cases similar to those encountered in Phase 1 than on the other cases (Table 2).

Having encountered a similar case in Phase 1 did not lead to more frequently giving this
The diagnostic scores obtained through reflective reasoning (Phase 3) on the cases similar to the diseases that had been encountered in Phase 1 (those cases subject to an availability bias in Phase 2) are presented Table 4. A significant main effect of "type of reasoning" was found in the ANOVA (F(1,34) = 8.46, MSE = .30, P = .006, η² = .20), indicating that reflection improved all participants' diagnoses compared to non-analytical reasoning. The percentage of Phase 1 diagnoses that were corrected or adhered to after reflection is shown in Table 3.

This study demonstrated that an availability bias, despite recent experiences with similar clinical cases was still used, yielding diagnostic errors, and that reflective reasoning can correct these errors. The results suggest that the occurrence and recognition of the reasoning approach used and the expertise can increase diagnostic accuracy.

Encountering only one case of a disease makes residents more prone to incorrectly giving that diagnosis to another patient. In emergency rooms, we see (often close in time) several patients with symptoms that can be caused by diseases that can occur together. In many clinical settings, therefore, conditions of availability bias prevail.

Appendix A

Example of a medical case

A 27-year-old woman presented with 11-month duration of complaints of diarrhea and flatulence and episodes of abdominal cramps. She has had stools 5-6 times a day, and has often woken up during the night for defecation. The feces are voluminous and soft without mucus, blood, or pus. The abdominal cramps are more severe just before defecation, after which they become less painful. The patient is fatigued and has experienced a 5-kg weight loss over the past 11 months. She also noticed red spots on her skin. She says that she has not had fever or joint pains. The patient consulted a doctor four months ago as well. The doctor prescribed ferrous sulphate for anemia, which she has been using until now. Family history: her father was treated for lung tuberculosis 20 years ago.

Physical examination:

Young, somewhat emaciated woman of otherwise healthy appearance. BP: 110/70; pulse: 80/min; temperature: 36°C. Mucocutaneous pallor (+/4). No other abnormalities.

Lab tests:

- Hemoglobin: 9 g/dL; Hematocrit: 34%; MCV: 74 fl; serum iron: 45 mg/dL (normal 50-170);
- Calcium: 8.1 mg/dL (normal 8.6-10); albumin: 3.2 g/dL (3.4-4.8); ALT: 38 U/L; AST: 25 U/L; PT 24 sec (12-22 sec). Feces: no worm eggs, no parasites, no white cells; stool fat level: 12g/24h (<7g/24h), D-Xylose test: positive. HIV antibodies: negative. PPD skin test: 5 mm.

Imaging tests:

- Chest X-ray: no abnormalities; Colonoscopy: no abnormalities.
Acknowledgments

The authors are thankful to Júlio César Penaforte, MD (Hospital Geral de Fortaleza, Brazil) and Joio Macedo Coelho Filho, MD, PhD (Faculty of Medicine, Federal University of Ceará, Brazil) for their permission to use the clinical cases that they prepared for previous studies, without compensation.

References

Table 1. Clinical cases used in each phase of the study.

<table>
<thead>
<tr>
<th>Set 1</th>
<th>Case A: Acute viral hepatitis</th>
<th>Case B: Inflammatory bowel disease</th>
<th>Neutral case 1: Meningitis</th>
<th>Neutral case 2: Pyelonephritis</th>
<th>Neutral case 3: Pneumonia</th>
<th>Neutral case 4: Hyperthyroidism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1</td>
<td>Exposure (diagnosis evaluation task)</td>
<td>Non-analytical diagnostic reasoning</td>
<td>Case similar to case A:</td>
<td>Liver cirrhosis</td>
<td>Primary sclerosing cholangitis</td>
<td>Case similar to case B:</td>
</tr>
<tr>
<td>Phase 2</td>
<td>Non-analytical diagnostic reasoning</td>
<td>Case similar to case B:</td>
<td>Liver cirrhosis</td>
<td>Primary sclerosing cholangitis</td>
<td>Case similar to case C:</td>
<td>Acute viral pericarditis</td>
</tr>
<tr>
<td>Phase 3</td>
<td>Reflective diagnostic reasoning</td>
<td>Case similar to case C:</td>
<td>Neutrophilia</td>
<td>Vitamin B12 Deficiency</td>
<td>Case similar to case D:</td>
<td>Acute viral pericarditis</td>
</tr>
</tbody>
</table>

Set 2 | Case C: Acute myocardial infarction | Case D: W's Encephalopathy | Neutral case 1: Meningitis | Neutral case 2: Pyelonephritis | Neutral case 3: Pneumonia | Neutral case 4: Hyperthyroidism |
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<td>Exposure (diagnosis evaluation task)</td>
<td>Non-analytical diagnostic reasoning</td>
<td>Liver cirrhosis</td>
<td>Primary sclerosing cholangitis</td>
<td>Pseudomembranous colitis</td>
<td>Acute viral pericarditis</td>
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<tr>
<td>Phase 2</td>
<td>Non-analytical diagnostic reasoning</td>
<td>Case similar to case C:</td>
<td>Liver cirrhosis</td>
<td>Primary sclerosing cholangitis</td>
<td>Case similar to case D:</td>
<td>Acute viral pericarditis</td>
</tr>
<tr>
<td>Phase 3</td>
<td>Reflective diagnostic reasoning</td>
<td>Case similar to case D:</td>
<td>Neutrophilia</td>
<td>Vitamin B12 Deficiency</td>
<td>Case similar to case E:</td>
<td>Acute viral pericarditis</td>
</tr>
</tbody>
</table>

Notes:
1. Cases potentially subject to bias
2. Cases not subject to bias

Figures

Figure 1. First and second year residents’ mean diagnostic accuracy scores (range from 0 – 4) in Phase 2 (non-analytical diagnostic reasoning) as a function of previous exposure to similar cases in Phase 1.