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JATS4R Authors & Affiliations

Version 2.0

A Recommended Practice of the
National Information Standards Organization

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Provenance

Version 1.1 can be found here.

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Change history

Validator tool results have been updated and validator tests
Validator tool tests and results have been updated.

Guidance on best practice tagging for the persistent IDs (PIDs) ROR, ISNI and social media handles (e.g., Twitter/X) in place of author correspondence have been added. ORCID and Ringgold have been updated.

Resources

See XML examples within the JATS4R Github repository.

Context

<front>, <contrib-group>, <contrib>, <aff>, <xref>, <label>, <institution>, <institution-id>, <city>, <state>,<country>, <postal-code>, <string-name>, <surname>, <given-name>, <contrib-id>, <collab>, <author-notes>, <on-behalf-of>,<author-comments>, <corresp>, <fn>, <anonymous>, <email>

@id, @ref-type, @institution-id-type, @country, @contrib-type, @corresp, @contrib-id-type, @authenticated, @equal-contrib, @ext-link-type, @initials

Description

These recommendations contain best practices for capturing authors and their affiliations, as well as how these should be associated with one another. The recommendations comprise the following three parts:

A. Author–affiliation associations
B. Affiliations (and that within the scope of affiliations, such as institutions, institutional IDs, etc.)
C. Authors (and that within the scope of authors, such as IDs, roles, etc)

Recommendations

Part A. Author–affiliation associations

Note: There are three commonly used patterns of associating authors to their affiliations, and it is the publisher's choice which to use. These are as follows:

- <aff> is contained directly within <contrib> (see Example 1A)
- <aff> is contained outside of <contrib> but within <contrib-group> (see Example 1B)
- <aff> is contained outside of both <contrib> and <contrib-group> (see Example 1C)

1. **Linking authors to affiliations.** If the affiliations (<aff>) are not included within the <contrib> element for each contributor, then <contrib> must contain an <xref> that references @id each relevant <aff>; see Example 1B. If there is a single <aff> within a contrib group an <xref> is not required. The <xref> element may be empty. Example 2 shows how different models of association may be used for different contrib types.

   [[Validator tool result: if <aff> is contained outside of both <contrib> and <contrib-group> and <xref> is missing ERROR]]

[[Validator tool result: if there is more than one <aff> in the <contrib-group> with no descendant::xref[@xref-type="aff"], ERROR]]

2. **@ref-type (on <xref>).** When linking a <contrib> to its <aff> use @ref-type="aff" on <xref>. Where there is more than one author and affiliation, sequential numbering is used (see Example 3a). If your platform does not support multiple attribute values under the xref you can use multiple xref elements with a single **@rid.**

[[Validator tool result: if @ref-type on <xref> != "aff" if @rid references an <aff> element ERROR]]

Part B. Affiliations

3. **<aff>.** Each <aff> must contain a single and complete affiliation. Do not include a string that represents more than one affiliation or that contains parts of affiliations, such as "Dept. of Biology and Dept. of Chemistry, University of Something", since each department of an institution is itself an affiliation, which may be assigned its own institutional ID, if such IDs are being used. See Examples 3A and 3B. For further discussion, see recommendations 5 and 6, below, concerning institutions and institution IDs, respectively.

NOTE: If a publisher wishes to follow this recommendation, but has a requirement to represent the original affiliation comprising two or more partial affiliations, then see Rendering affiliation strings comprising partial affiliations, at the bottom of this document.

[[Validator tool result: not possible to check NONE]]

4. **<label>.** If a label (such as a letter or number or combination thereof, which can be superscripted, and which precedes the actual affiliation; e.g. "ª") is required for an affiliation, then capture the content of the label within a <label> element, and not directly within <aff>. See Example 1B.

[[Validator result: if <xref> is present within <contrib> and contains content AND the corresponding <aff> does not contain a <label>. Error if an aff starts with a <sup> (not in a <label>) that is only one character WARNING]]

5. **<institution>.** This element should be used to contain the name of an institution, where "institution" may be a university, a department, office, laboratory, etc. In the case of hierarchical nested institutional ID, for each ID type, the most granular ID should be included, although IDs at each hierarchical level can be included (e.g. for university, department, and laboratory) within an individual <institution> element. See further comment in the next recommendation for <institution-id>. See Examples 3A and 3B.

[[Validator tool result: if <aff> does not contain <institution> INFO]]

6. **<institution-id>**. Capturing an institutional ID is not mandatory at this time. However, if the publisher does capture one, they should make every effort to ensure that it is accurate. Use <institution-id> to contain the ID. This may be a string or URL as detailed below for Ringgold, ROR or ISNI.

   For ISNI and Ringgold, the ID string should be used rather than the full url. When an affiliation mentions by name any parts of more than one level of an organization's hierarchy, all known IDs should be specified . The <institution-wrap> element can be used with <institution> (name) and <institution-id> for each named part. See Example 3a.

   For ROR, the full url is defined as the persistent ID (PID) and therefore should be used. See Example 3a.

   Contents of the <institution-id> element is the ID string or URL itself that is associated with the organization named in the <institution> element within the same <institution-wrap>, while the @institution-id-type attribute identifies whether the id is ROR, ISNI etc.

   NOTE 1: The <institution-id> and <institution> elements should be contained within <institution-wrap>. Each institution name/institution ID pair (whether the institution is a university, a department, a lab, or an office, etc.) should be contained within its own <institution-wrap> element. See Example 3a.

   NOTE 2: The <institution-id> element is only available in JATS 1.1 and forward. Given that there is no effective or legitimate way of capturing this information in JATS 1.0 and backward, publishers who wish to capture institution IDs in article XML should consider moving to a more recent version of JATS.

   NOTE 3: In the case of Open Funder Registry (OFR) IDs, <institution-id> and @institution-id-type best practice is detailed in the JATS4R Funding Recommendations.

7. **@institution-id-type.** This attribute must be used to indicate the id-assigning authority, for example, “ringgold”.

   [[Validator tool result: if @institution-id-type is missing when <institution-id> is present ERROR]]

8. **<city>, <state>, <country>, <postal-code>.** If the publisher wishes to capture detailed values for city, state/province, country, or postal/zip codes, they should use the specific elements provided for these. **NOTE:** These elements are only available in JATS 1.1 and later. Where needed, <addr-line> can be used to tag address parts not covered. See Example 3b.

9. **@country.** If <country> is used, then @country must also be used and must be set to the 2-letter country code as specified in ISO 3166-1 (recommended in the JATS tag library).

   [[Validator tool result: if @country is not present when <country> is present and if the value of @country is not on the ISO 3166-1 list of 2 letter country codes. Note: implementation would involve a

controlled list of 2 letter ISO country codes with the corresponding country name given with common variations and multiple languages (e.g. English and the local national languages). This could start with small list for a few countries WARNING]]

10. **@content-type**

    Affiliation at the time of publication. If current affiliation is to be specified this should be done using

    A. <aff> not within <contrib>
    xref[@ref-type='aff'][@**specific-use='current'**] or

    B. <aff> within <contrib>
    aff[@**content-type='current'**]

Part C. Authors/Contributors

11. **<contrib>, @contrib-type.** Contain each author within a <contrib> element. If a <contrib> contains an author, then @contrib-type must be set to "author". When there is a need to indicate different contributor types, this attribute can also be used with values e.g., "editor", "translator", "research-assistant". See Example 2.

    [[Validator result: if no @contrib-type="author" found WARNING]]

12. **@corresp.** Use this attribute on <contrib>, set to value "yes", to identify the corresponding author(s). See Example 1A.
13. **<string-name>.** It is at the publisher's discretion whether to use <name> or <string-name> to capture an author's name, though note that <string-name> is not allowed in <contrib> in JATS Blue (Publishing) until version 1.2d1. However, if a name is not easily broken down into a surname (<surname>) and given names (<given-name>) (e.g., names such as "Cher", "Barbie" or "Meatloaf"), then if the publisher is using JATS Green (Archiving), they should contain the entire string of the name in <string-name> to facilitate retrieval, per the JATS tag library guidelines.

    [[Validator tool result: not possible to check NONE]]

14. **<contrib-id>**. Use this element to contain author-related PIDs such as ORCID or alternative. For ORCID ID the full url string should be used as the correct form of this PID. See Example 1B.

15. **@contrib-id-type**. This attribute must be used to specify the id-assigning authority.

    [[Validator tool result: if @contrib-id-type is missing or empty and <contrib-id> is present ERROR]]

16. **@authenticated**. If the ORCID id has been authenticated, i.e. through a person validating the identifier via ORCID profile authentication or another verification process, this attribute should be used to indicate this with value “true”. This is only possible in JATS version 1.1 onwards. See Example 1B.
17. **@equal-contrib.** This attribute is optional, but should be used in situations with more than one author who each contributed equally. If present, value must be set to either "yes" (equal) or "no" (greater or lesser) depending on contribution level. Where this tag is used the contributions of the authors should be qualified somewhere within the article. This should be done as a footnote with an xref and a <fn> with attribute fn-type="con". See Example 4.

    [[Validator tool result: if only one author has @equal-contrib=”yes” ERROR]]

18. **<collab>**. When an “author” is actually a collaborative group with its own name, use <collab> to contain the name. Note that @contrib-type=”author” should be applied to the <contrib> containing the <collab>, and not to the individual descendant <contrib> elements within <collab>. See Examples 5a and 5b.

    [[Validator tool result: if <contrib contrib-type=”author”> is a descendant of <collab> ERROR]]

    [[Validator tool result: if <collab> is a descendant of <article-meta> and is not a child of <contrib contrib-type=”author”> WARNING]]

19. **<author-notes>.** Author notes should be used to contain footnotes on authors, correspondence information, and any other information that applies to the group of authors as a whole. See Example 4.

    [[Validator tool result: not possible to check NONE]]

20. **<author-comments>**. Do not use this element to indicate that an author is anonymous or to indicate that an author is acting on behalf of a group. Instead, use, respectively, <anonymous> and <on-behalf-of>. Do not use this element to contain author footnotes or author correspondence information; see <author-notes>, above.

    [[Validator tool result: not possible to check NONE]]

21. **<anonymous>**. Where a placeholder is needed for a contributor where the actual name is unknown or not disclosed <anonymous/>. See Example 6.

22. **<corresp>**.This element should be used within <author-notes> to provide correspondence information for corresponding author(s). <email> can be used to mark up the email address to be used for correspondence. See Example 7.

23. **@ext-link-type**. This should be used to mark up X (formerly known as Twitter), Mastodon, LinkedIn URLs, or other social media handles for correspondence via social media. See Example 7.

24. **<on-behalf-of>.** Use this element to contain the name of the organization or group on whose behalf an author is working. See Example 1C. This element can be contained within <collab>, <contrib> or <contrib-group>. Where there are multiple authors where the same <on-behalf-of> applies, you can have all applicable authors in a single <contrib-group> with a <on-behalf-of> as the final element.

    [[Validator tool result: not possible to check NONE]]

25. **@initials**. If a contributor's initials are to be captured (either surname or given name initials), use @initials on <surname> or <given-names> for this purpose. However, if the contributor has only initials (and no name), then contain the initials directly within <surname> or <given-names>, as appropriate. See Examples 1A & 1B.

    [[Validator tool result: if content of @initials != RegEx ^\p{L}{1,4}$ WARNING]]

Examples

Examples 1A–1C. The three most commonly used models of author-affiliation associations.

1A. Affiliations are within <contrib>

```
<contrib-group>
        <contrib contrib-type=”author” corresp="yes">
          <name>
            <surname initials=”M”>Mitchell</surname>
            <given-names initials=”AP”>Aaron P.</given-names>
          </name>
          <aff>Carnegie Mellon University</aff>
        </contrib>
  </contrib-group>
```

1B. Affiliations are outside of <contrib> but within <contrib-group>

```
<contrib-group>
        <contrib contrib-type=”author”>
          <contrib-id contrib-id-type="orcid" authenticated="true">https://orcid.org/0000-0002-8062-
        6542</contrib-id>
          <name>
            <surname>J</surname>
            <given-names>S</given-names>
          </name>
          <xref ref-type="aff" rid="aff1"><sup>a</sup></xref>
          <xref ref-type="aff" rid="aff2"><sup>b</sup></xref>
        </contrib>
```

```
                <aff id="aff1"><label>a</label>
          <institution-wrap><institution-id institution-id-type=”ringgold”>1812</institution-
          id><institution>Harvard University</institution></institution-wrap>,
          <institution-wrap><institution-id institution-id-type=”ringgold”>2188</institution-
          id><institution>Harvard Law School</institution></institution-wrap>,
          <city>Cambridge</city>, <state>MA</state> <postal-code>02138</postal-code>, <country
          country=”us”>United States</country>
    </aff>
        <aff id="aff2"><label>b</label>
          <institution-wrap><institution-id institution-id-type=”ringgold”>89611</institution-
          id><institution>Dalhousie University Faculty of Agriculture</institution></institution-wrap>,
          <institution-wrap><institution-id institution-id-type=”isni”>0000000122975165</institution-
          id><institution>Dalhousie University Department of Plant Food</institution></institution-wrap>,
          <city>Halifax</city>, <state>NS</state> <postal-code>B3H 4R2</postal-code>, <country
          country=”ca”>Canada</country>
    </aff>
         </contrib-group>
```

1C. Affiliations are outside of <contrib-group>

```
        <contrib-group>
                        <contrib contrib-type=”author”>
                                <name>
                                        <surname>Kosaki</surname>
                                        <given-names>Mika</given-names>
                                </name>
                                <xref ref-type="aff" rid="aff1"><sup>1</sup></xref>
                        </contrib>
                        <contrib contrib-type="author">
                                <name>
                                        <surname>Duchesneau</surname>
                                        <given-names>Audrey</given-names>
                                </name>
                                <xref ref-type="aff" rid="aff1"><sup>1</sup></xref>
                        </contrib>
                        <on-behalf-of>American Astronomical Society</on-behalf-of>
                </contrib-group>
                <aff id="aff1">
                        <label>1</label>
                        Department of Biology, McGill University, Montréal, QC
                </aff>
```

Example 2. Using a different model of association for different contrib types.

```
<contrib-group>
          <contrib contrib-type="editor">
            <name>
              <surname>Robichaud</surname>
              <given-names>Monique</given-names>
            </name>
```

```
            <aff>Simon Fraser University</aff>
          </contrib>
 </contrib-group>
<contrib-group>
          <contrib contrib-type="author">
            <name>
              <surname>Juretschko</surname>
              <given-names>Stefan</given-names>
            </name>
            <xref ref-type="aff" rid="aff1"><sup>a</sup></xref>
          </contrib>
          <aff id="aff1"><label>a</label>Northwell Health Laboratories, Pathology and
            Laboratory Medicine, Lake Success, New York, USA</aff>
 </contrib-group>
```

Example 3A. Complete and separate affiliations, including institutional IDs and more granular institutional mark-up

```
<contrib-group content-type="authors">
      <contrib contrib-type="author">
            <name>
              <surname>Voth</surname>
              <given-names>Irma</given-names>
            </name>
            <xref ref-type="aff" rid="aff1 aff2"><sup>a,b</sup></xref>
      </contrib>
       <contrib contrib-type="author">
            <name>
              <surname>Von Risen</surname>
              <given-names>Lottie</given-names>
            </name>
            <xref ref-type="aff" rid="aff2" specific-use='current' ><sup>b</sup></xref>
      </contrib>
       <contrib contrib-type="author">
            <name>
              <surname>Flame</surname>
              <given-names>Mo</given-names>
            </name>
            <xref ref-type="aff" rid="aff3 aff4"><sup>c,d</sup></xref>
      </contrib>
      <aff id="aff1"><label>a</label>
            <institution-wrap><institution-id institution-id-type="ringgold">1812</institution-
            id><institution>Harvard University</institution></institution-wrap>,
            <institution-wrap><institution-id institution-id-type="ringgold">2188</institution-
            id><institution>Harvard Law School</institution></institution-wrap>,
            <city>Cambridge</city>, <state>MA</state> <postal-code>02138</postal-code>, <country
            @country="us">United States</country>
     </aff>
          <aff id="aff2"><label>b</label>
```

```
        <institution-wrap><institution-id institution-id-type=”ringgold”>89611</institution-
        id><institution>Dalhousie University Faculty of Agriculture</institution></institution-wrap>,
        <institution-wrap><institution-id institution-id-type=”isni”>0000000122975165</institution-
        id><institution>Dalhousie University Department of Plant Food</institution></institution-wrap>,
        <city>Halifax</city>, <state>NS</state> <postal-code>B3H 4R2</postal-code>, <country
        country=”ca”>Canada</country>
    </aff>
    <aff id="aff3"><label>c</label>
        <institution-wrap><institution-id institution-id-type=”ror”>https://ror.org/01cwqze88</institution-
        id><institution>National Institutes of Health</institution></institution-wrap>,
        <city>Bethesda</city>, <state>MD</state> <postal-code>20892</postal-code>, <country
        country=”us”>United States</country>
    </aff>
    <aff id="aff4"><label>d</label>
        <institution-wrap><institution-id institution-id-type=”isni”>0000000122975165</institution-
        id><institution>Dalhousie University Department of Plant Food</institution></institution-wrap>,
        <city>Halifax</city>, <state>NS</state> <postal-code>B3H 4R2</postal-code>, <country
        country=”ca”>Canada</country>
    </aff>
     </contrib-group>
```

Example 3B. Complete and separate affiliations

```
<contrib-group content-type="authors">
      <contrib contrib-type="author">
            <name>
               <surname>Mitchell</surname>
               <given-names>Glenn</given-names>
            </name>
            <xref ref-type="aff" rid="aff1 aff2"><sup>a,b</sup></xref>
      </contrib>
       <contrib contrib-type="author">
            <name>
               <surname>Ahearn</surname>
               <given-names>Susan</given-names>
            </name>
            <xref ref-type="aff" rid="aff2"><sup>b</sup></xref>
      </contrib>
      <aff id="aff1"><label>a</label><institution>Department of Education, Memorial University of
Newfoundland</institution>,<addr-line>232 Elizabeth Ave.</addr-line>, <city>St. John’s</city>,
<state>NF</state> <postal-code>A0J 1W0</postal-code>, <country country=”ca”>Canada</country></aff>
      <aff id="aff2"><label>b</label><institution>Department of Psychology, Memorial University of
Newfoundland</institution>, <addr-line>232 Elizabeth Ave.</addr-line>, <city>St. John’s</city>,
<state>NF</state> <postal-code>A0J 1W0</postal-code>, <country country=”ca”>Canada</country></aff>
      </contrib-group>
```

Example 4.

```
        ...
        <contrib-group>
         <contrib contrib-type="author" equal-contrib="yes">
```

```
 <name><surname initials="L">Lawrence</surname>
  <given-names initials="SP">Sharon Peniston</given-names>
 </name></contrib>
<contrib contrib-type="author" equal-contrib="yes">
 <name><surname initials="M">Mason</surname>
  <given-names initials="P">Priya</given-names>
 </name></contrib>
<contrib contrib-type="author">
 <name><surname initials="M">Miller</surname>
  <given-names initials="DB">Donna Bunch</given-names>
 </name></contrib>
</contrib-group>
.....
<author-notes>
<fn fn-type="con"><p>SPL and DBM are equal contributors ...</p></fn>
 </author-notes>
...
```

Example 5a. A group of authors with affiliations, in which one of the authors is a collaborative group.

Variation 1: affiliations are implied by position

```
<contrib-group>

  <contrib contrib-type=”author”>

                    <collab>The authors and affiliations working group </collab>
               <aff id=”aff3”>Dept. Of Philosophy, University of XML</aff>
 </contrib>
        <contrib contrib-type=”author”>
                                      <string-name>Barbie</string-name>
                                     <aff id=”aff1”>1959 Malibu Way</aff>
                                  </contrib>
</contrib-group>
```

Variation 2: affiliations are associated via <xref> elements

```
<contrib-group>

 <contrib contrib-type=”author”>

      <collab>The authors and affiliations working group</collab>
            <xref ref-type=”aff” rid=”aff1”/>
         </contrib>
<contrib contrib-type=”author”>
           <string-name><surname>Cook</surname><given-names>James
           </given-names></string-name>
           <xref ref-type=”aff” rid=”aff2”/>
         </contrib>
          <aff id=”aff1”>Buckingham Palace, England</aff>
         <aff id=”aff2”>Royal Navy, London, UK</aff>
```

</contrib-group>

Example 5b. A collaborative author group in which the group itself has an affiliation and each author in the group also has an affiliation

Note: The following mark-up is not necessarily the only way to capture constituent contributors within a collaborative group. The purpose of the example here is to show how affiliations would be included. Please see the bottom of this document for an alternative mark-up of a collaborative group as another example.

Variation 1: affiliations are implied by position

In this model, the collaborative group itself has an affiliation, which is located within its <contrib> element (association by position). The constituent contributors also each have affiliations, and each of these <aff> elements is located within the relevant <contrib> elements (also associated by position).

```
<contrib-group>
  <contrib contrib-type="author">
                    <collab>The authors and affiliations working group
                        <contrib-group>
                            <contrib>
                                <string-name>Barbie</string-name>
                                <aff id="aff1">1959 Malibu Way</aff>
                            </contrib>
                            <contrib>
                              <string-name><surname>Cook</surname><given-names>James
                              </given-names></string-name>
                              <aff id="aff2">Royal Navy, London, UK</aff>
                            </contrib>
                        </contrib-group>
                       </collab>
          <aff id="aff3">Dept. Of Philosophy, University of XML</aff>
                </contrib>
</contrib-group>
```

Variation 2: Affiliations are associated via <xref> elements

In this model, the collaborative group links to its own affiliation via an <xref> element located within its parent <contrib> element; the <aff> is located outside of this <contrib>.

The constituents of the collab group also have affiliations, and these are associated via <xref> elements within each <contrib>; the <aff> elements for each of these is located outside of the <contrib> elements but within their parent <contrib-group>.

```
<contrib-group>
 <contrib contrib-type="author">
```

```
                <collab>The authors and affiliations working group
                    <contrib-group>
                        <contrib>
                            <string-name>Barbie</string-name>
                            <xref ref-type=”aff” rid=”aff1”/>
                        </contrib>
                        <contrib>
                            <string-name><surname>Cook</surname><given-names>James
                            </given-names></string-name>
                            <xref ref-type=”aff” rid=”aff2”/>
                        </contrib>
                        <aff id=”aff1”>Buckingham Palace, England</aff>
                        <aff id=”aff2”>Royal Navy, London, UK</aff>
                    </contrib-group>
                    </collab>
                <xref rid=”aff3” ref-type=”aff3”/>
        </contrib>
        <aff id=”aff3”>Dept. Of Philosophy, University of XML</aff>
  </contrib-group>
```

Example 6. Anonymous author

```
<contrib-group>
        <contrib contrib-type=”author”><anonymous/>
                </contrib>
   </contrib-group>
```

Example 7. Correspondence information for authors within <author-notes>

```
  <author-notes>
        <corresp id="cor3">To whom correspondence should be addressed. Email:
  <email>bartonc@shield.com</email>, Twitter: <ext-link ext-link-type="twitter"
  xlink:href="https://twitter.com/ClintBartonShield">@ClintBartonShield</ext-link></corresp>
  </author-notes>
```

Rendering affiliation strings comprising partial affiliations

N.B. It is JATS4R’s recommendation that each <aff> element must only contain a single and complete affiliation (see Part B, Affiliations, further up in this document). Publishers who wish to follow this recommendation but also have a requirement to display a string of concatenated partial affiliations (such as in the PDF or on a web page) may consider using one of the approaches listed below for rendering that string.

Note that these methods are not to be considered as alternatives to following the single-affiliation-per-aff recommendation; please note the caveats for each concerning interoperability/reuse.

Method 1: Capture the string within XML by using @specific-use and @content-type on <aff> within <aff-alternatives>. Contain the string in an <aff> element of its own (i.e., in addition to the <aff> elements that contain the single and complete affiliations). Use @specific-use="display" and @content-type="combined-aff". This <aff> is placed within an <aff-alternatives> element to indicate that it is an alternative representation of the affiliations. See the example below.

N.B.:

1. To keep as close to best practices as possible, consider using this method only for PDF composition, and not for delivery online or storing affiliation information.

2. Many systems ignore attributes, and the <aff> containing the string required for display may be treated as another "real" affiliation. Ideally it would be best to avoid including this <aff> in XML destined for exchange (e.g., in deposits to aggregators, indexers, archives, etc).

3. Strictly speaking, <aff-alternatives> is an element that is meant to contain another version of a single affiliation, and not a combination of one or more affiliations. See the description of usage in the JATS tag library. Therefore the use of this element might be confusing to systems and people outside of the publisher's shop.

Example: Using <aff> within <aff-alternatives> with attributes to capture a string of concatenated affiliation parts for display

```
<contrib-group content-type="authors">
    <contrib contrib-type="author">
            <name>
              <surname>Mitchell</surname>
              <given-names>Glenn</given-names>
            </name>
            <xref ref-type="aff" rid="aff1 aff3"><sup>a</sup></xref>
    </contrib>
     <contrib contrib-type="author">
            <name>
              <surname>Ahearn</surname>
              <given-names>Susan</given-names>
            </name>
            <xref ref-type="aff" rid="aff2 aff3"><sup>b</sup></xref>
    </contrib>
    <aff id="aff1"><label>a</label>Department of Education, Memorial University of Newfoundland, St. John's, NF A0J 1W0, Canada</aff>
    <aff id="aff2"><label>b</label>Department of Psychology, Memorial University of Newfoundland, St. John's, NF A0J 1W0, Canada</aff>
```

```
    <aff-alternatives>
     <aff id="aff3" specific-use="display" content-type="combined-aff" rid="aff1 aff2"><label>a,b</label>
Depts. Of Education and Psychology, Memorial University of Newfoundland</aff>
    </aff-alternatives>
   </contrib-group>
```

Method 2: Use XSLT processing. For this to work easily, a couple of pre-conditions must be met. First, the affiliations should be internally parsed so that institutions and addresses are tagged. Second, affiliations should be arranged to group those that share institutions and addresses, even if that causes the numbers or letters used to indicate links to appear out of order in the author line.

Given:

```
<contrib-group>
  <contrib contrib-type="author">
    <name name-style="western"><surname>Panda</surname><given-names>Ankit</given-names></name>
    <xref rid="aff1" ref-type="aff"><sup>1</sup></xref>
    <xref rid="aff4" ref-type="aff"><sup>4</sup></xref>
  </contrib>
  <contrib contrib-type="author">
    <name name-style="western"><surname>Hanham</surname><given-names>Melissa</given-
names></name>
    <xref rid="aff2" ref-type="aff"><sup>2</sup></xref>
    <xref rid="aff3" ref-type="aff"><sup>3</sup></xref>
  </contrib>
  <contrib contrib-type="author">
    <name name-style="western"><surname>Lewis</surname><given-names>Jeffrey</given-
names></name>
    <xref rid="aff2" ref-type="aff"><sup>2</sup></xref>
  </contrib>
  <aff id="aff1"><label>1</label>Department of Medicine, <institution>University of Toronto</institution>,
<addr-line><city>Toronto</city>, <state>ON</state></addr-line>, <country>Canada</country></aff>
  <aff id="aff2"><label>2</label>Institute of Medical Science, <institution>University of Toronto</institution>,
<addr-line><city>Toronto</city>, <state>ON</state></addr-line>, <country>Canada</country></aff>
  <aff id="aff3"><label>3</label>Dalla Lana School of Public Health, <institution>University of
Toronto</institution>, <addr-line><city>Toronto</city>, <state>ON</state></addr-line>,
<country>Canada</country></aff>
  <aff id="aff4"><label>4</label>Toronto Rehabilitation Institute, <institution>University Health
Network</institution>, <addr-line><city>Toronto</city>, <state>ON</state></addr-line>,
<country>Canada</country></aff>
</contrib-group>
```

An XSLT could recognize that the first three affiliations are identical starting at the <institution> element. It could then create a single affiliation paragraph by

1. deleting all but the last instance of repeated information (important: the repeated information must start with the <institution> to avoid collapsing affiliations that share only location information)
2. transforming <label> elements to <sup>

3. inserting generated punctuation and connectors (e.g., “and”) depending on the number of affiliations with repeated institutions, etc.

This would yield:
<aff specific-use="display">¹Department of Medicine, ²Institute of Medical Science, and ³Dalla Lana School of Public Health, <institution>University of Toronto</institution>, <addr-line><city>Toronto</city>, <state>ON</state></addr-line>, <country>Canada</country>; ⁴Toronto Rehabilitation Institute, <institution>University Health Network</institution>, <addr-line><city>Toronto</city>, <state>ON</state></addr-line>, <country>Canada</country></aff>

(The generated text is highlighted. If there had been only two affiliations with repeated institutions, then the comma after the first department would have had to be removed before adding “and”.)

N.B. To keep as close to best practices as possible, consider using this method only for PDF composition, and not for delivery online or storing affiliation information.

If your affiliations do not have institutions and addresses parsed, it may be possible to achieve the same effect by adding processing instructions just before the repeated information. However, you should check with those that handle and host your XML before doing so.

Strictly speaking, the collapse of affiliations into a single paragraph would be achieved via XSLT even without the input affiliations first being arranged so that those that share an institution are grouped. The processing would be somewhat more complex and would result in superscripted numbers/letters that are out of order in the affiliation paragraph rather than in the author line.

An alternative mark-up structure for collaborative groups with constituent contributors

Since it is not common to see collaborative groups with constituent contributors listed, the following mark-up is offered as a suggested alternative to those given in example 5b. Neither the following mark-up nor that in example 5b is preferred for any particular reason.

```
<contrib-group>
  <contrib contrib-type="author" id="collab1">
        <collab>The MARS Group</collab>
        <xref ref-type="other" rid="fn1-35378645">&#x0002A;</xref>
  </contrib>
</contrib-group>
<contrib-group content-type="collab-list">
  <contrib contrib-type="non-byline-author" rid="collab1">
        <name>
```

<surname>Wright</surname>
<given-names>Rick W.</given-names>
</name>
<degrees>MD</degrees>
</contrib>
<contrib contrib-type="non-byline-author" rid="collab1">
<name>
<surname>Huston</surname>
<given-names>Laura J.</given-names>
</name>
<degrees>MS</degrees>
</contrib>
<contrib contrib-type="non-byline-author" rid="collab1">
<name>
<surname>Spindler</surname>
<given-names>Kurt P.</given-names>
</name>
<degrees>MD</degrees>
</contrib>
<contrib contrib-type="non-byline-author" rid="collab1">
<name>
<surname>Dunn</surname>
<given-names>Warren R.</given-names>
</name>
<degrees>MD, MPH</degrees>
</contrib>
<contrib contrib-type="non-byline-author" rid="collab1">
<name>
<surname>Haas</surname>
<given-names>Amanda K.</given-names>
</name>
<degrees>MA</degrees>
</contrib>
</contrib-group>
<author-notes>
<fn fn-type="other" id="fn1-35378645">
<label>*</label>
The writing committee for this article consisted of Rick W. Wright, MD; Laura J. Huston, MS; Kurt P. Spindler, MD; Warren R. Dunn, MD, MPH; Amanda K. Haas, MA. Members of the MARS Group are listed in the Contributing Authors section at the end of this article.
</fn>
</author-notes>