types, A, O, B, AB, or RH, a vertical bar ("|") is used in its declaration to indicate this option.

Through the DTD specification, an XML document can be validated. However, an XML document may not contain a DTD if it is well formed as described in the following section.

(2) XML Documents

An XML document consists of several elements. Each element must be labeled with a starting tag (<tag name>), and an ending tag (</tag name>). There is one and only one root element in the document. Referring to the example illustrated in the previous section, the starting tag of the chart summary is specified as <emergency chart>, and the ending tag as </emergency chart>. More importantly, in an XML document, the starting tag and the ending tag of a sub-element must appear in between the starting tag and the ending tag of the element to which the sub-element belongs.

In the example described, an instance of the XML document corresponding to the DTD can be encoded and is shown below.

```
<?xml version="1.0" encoding="big5" ?>
<?xml-stylesheet type="text/xsl" href="wfexxsl.xsl"?>
<!DOCTYPE emergency chart SYSTEM "wfex.dtd">
<emergency chart>
<blood exam>
<Hb>15.6</Hb> <Hct>42</Hct>
<Wbc-dc>
 <band>1</band> <baso>1</baso> <seg>65</seg>
<mono>4</mono><eos>2</eos> <lymph>35</lympho>
</Wbc-dc> <blood type>O</blood type>
</blood exam>
</emergency chart>
```

The chart summary shown above is valid because it includes the DTD, named wfex.dtd. As mentioned previously, an XML document may not include the DTD part. If this is the case, the structures of elements in the document must be nested. That is, the starting tag and the ending tag of a sub-element must appear in between the starting tag and the ending tag of the element to which the sub-element belongs. The XML document that meets the above requirement even though it is

without a DTD is well formed. An XML document must be either valid or well formed.

(3) Presentation of XML Documents (XSL)

The second line in the XML-based chart summary shown in the previous section specifies the presentation style of the document. The presentation of XML documents can be specified using XSL (Style-sheet Language). The XSL enables users to define their own presentation styles on their computer monitors. They can program their presentation templates using the XSL, then store them into different files with the extension "xsl". In their XML documents, the corresponding xsl file must be included.

Again, referring to the example again, if the chart summary of the emergency transported referral must be presented as shown in Fig. 1, the template can be programmed, and saved as a "wfexxsl.xsl" file. Note that the second line in the XML-based chart summary is used to include the xsl template file.

```
<?xml-stylesheet type="text/xsl" href="wfexxsl.xsl"?>
```

The detailed content of the file is omitted because it is not our main focus here. Most commercial web browsers can now interpret the XSL specification. For example, Fig. 1 is the result of the interpretation of the chart sumamry by Microsoft Internet Explorer IE5.0.

Representation of Referral Initiation Forms

In fact, the chart summary abstracted from a set of medical records is somewhat arbitrary. However, the chart summary must contain the essential information required for continuity of medical care. The chart summary usually includes information on the referral's chief complaints, allergies, diagnoses, care plans, the GCS (Glasgow Coma Scale), and advice from the accepting physicians. The chief complaint represents what a patient describes as his/her syndromes. The care plan describes what will be performed or what has been performed during the care of a patient, and usually includes his/her laboratory tests, radiology results (x-ray, endoscopy, sonography, etc.), and treatments. The GCS is used for evaluating the trauma of a patient with nervous system injury. GCS is extremely important in dealing with transported emergency patients.

A chart summary can be represented by a hierar-