What should be known? What should be avoided?

Lipiodol® and cyanoacrylate-based glue (Glubran®2/NBCA) mixing process

**Objectives**
- Deliver the detailed methodology of Lipiodol® and cyanoacrylate-based glue (Glubran®2/NBCA) mixing process
- Provide appropriate technical recommendations for vascular embolization with Lipiodol® and cyanoacrylate-based glue (Glubran®2/NBCA)

**Advised products & materials**
- Lipiodol® Ultra-Fluid - Manufacturer GUERBET
- NBCA or Glubran®2 surgical glue - Manufacturer GEM S.r.l.
- 5%-33% glucose or dextrose
- Three 1 mL or three 5 mL polyethylene (PE) or polypropylene (PP) syringes with luer lock
- 18 G needles
- 3-way-stopscocks
- One coaxial microcatheter

**Examples of applications**
- Varicocele
- Organ-end artery
- Hypervascularized tumors
- Portal vein embolization
- Venous malformations
- Lymphatic leakage
- Low-flow AVM
- High-flow AVM
- Malignant leaks

**Cytosacrylate-based glue (Glubran®2/NBCA)/Lipiodol® dilution ratios**

<table>
<thead>
<tr>
<th>NBCA or Glubran®2</th>
<th>Lipiodol®</th>
<th>Polymerization time (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 % (1:1)</td>
<td>3.2 ± 0.8</td>
<td></td>
</tr>
<tr>
<td>33 % (1:3)</td>
<td>4.7 ± 0.5</td>
<td></td>
</tr>
<tr>
<td>25 % (1:4)</td>
<td>7.5 ± 0.8</td>
<td></td>
</tr>
<tr>
<td>20 % (1:5)</td>
<td>11.8 ± 1.5</td>
<td></td>
</tr>
</tbody>
</table>

**Parentheses show NBCA volume: Lipiodol® volume**

b) In vitro polymerization chart of NBCA/Lipiodol® mixtures in saline solution. (caution: values obtained in static conditions, for information only). The conditions in vitro are not rigorously predictive of clinical conditions.

For complete information about precautions and optimal usage conditions, we recommend consulting the instruction for use supplied with the device. Use only in countries with applicable health authority registrations.

Check summary of product information at: guerbet-interventional.com
What should be known and/or avoided?

- Always check the state of fluidity of cyanoacrylate-based glue (Glubran®2/NBCA) and its transparency. If the product appears thickened and/or cloudy, it should not be used.  
- If an early polymerization of the cyanoacrylate-based glue (Glubran®2/NBCA)/Lipiodol® mixture occurs in the syringe, the mixture must not be injected and the syringe must be discarded.

- Never use saline solution nor any ionic contrast medium during the procedure. The mixture should not be injected if it is in contact with an ionic solution.
- In case of contact with eyes, they must be washed immediately with distilled water. If polymerization happens, detachment will occur spontaneously within 2-3 days.

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Method of mixture preparation and injection  
1. Aspire Lipiodol® & NBCA or Glubran®2 from their containers with two 1 mL or 5 mL syringes equipped with 18 G needles respectively.
2. Place the microcatheter.
3. Remove the microcatheter promptly once the endpoint of embolization is angiographically reached.
4. Hook up the two syringes on a 3-way stopcock.
5. Inject slowly the mixture of Lipiodol® & NBCA or Glubran®2 by the syringes of 1 ml or 5 ml under the radiography guidance until endpoint of embolization.
6. Apply back & forth movements before each injection.
7. Flush the microcatheter with glucose or dextrose (5% - 33%), prior to the injection of the mixture, to avoid undesired polymerization in the anatomic microcatheter.

References
16. IFU of Glubran®2.

Document reviewed by Dr. Audrey Fohlen, University hospital, Caen, France; Romaric Loffroy, University Hospital, Dijon, France.