Chromoendoscopy and dyes

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• Why spray dye?
• Classification
• When spray dye?
• How to spray dye
  • Preparation
  • Application
• Quiz
Why dye spray?

- Detection of lesions
- Evaluation of lesions
NBI is not enough?

White light  
NBI  
Indigo carmine
Endoscopic appearance of advanced and superficial cancers

Esophagus

Stomach

Courtesy of Dr Noriya Uedo
Classification of stains


Contrast method

Absorptive method (vital staining)

Reactive method

Indigo carmine

Crystal violet

Iodine

Courtesy of Dr Noriya Uedo
# Major chromoendoscopy methods and indication

<table>
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<th>Dye</th>
<th>Classification</th>
<th>Color</th>
<th>Target organ</th>
<th>Indication</th>
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<tr>
<td>Indigo carmine</td>
<td>Contrast method</td>
<td>Blue</td>
<td>Barrett’s esophagus, stomach, colon (columnar epithelium)</td>
<td>• Detection and characterization of lesions with irregularities</td>
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<tr>
<td>Methylene blue</td>
<td>Contrast method</td>
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<td></td>
<td>Absorptive method</td>
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<td>Barrett’s esophagus, stomach</td>
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<td>Violet</td>
<td>Colon</td>
<td>• Characterization of colonic tumors</td>
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<td>Iodine</td>
<td>Reactive method</td>
<td>Brown</td>
<td>Esophagus (squamous epithelium)</td>
<td>• Detection and characterization of lesions</td>
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Courtesy of Dr Noriya Uedo
When

**Indigo carmine**

Targeted spray - confirm abnormality, more detail

Pan colonic spray - for lesion detection

- **UC surveillance:** looking for dysplasias
- **FAP, MAP:** polyp counts
- **?serrated polyposis:** looking for subtle lesions
**Indigo Carmine**

- **Detection**
  - Spraying catheter is used onto entire surface of the hollow

- **Characterization**
  - Targeted administration with syringe flushing through working channel
Different concentration of Indigo carmine

0.04% Indigo carmine

0.2% Indigo carmine

Courtesy of Dr Noriya Uedo
Recipes

0.1% Indigo carmine

Ampule 20mg/5ml (0.4%)

50ml syringe

30ml water
2 ampule
(0.5ml Infacol)

30ml syringe

15ml water
1 ampule
(0.2ml Infacol)

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## Recipes

### Indigo carmine

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<tr>
<td>50ml syringe</td>
</tr>
<tr>
<td>Indigo carmine</td>
</tr>
<tr>
<td>30ml syringe</td>
</tr>
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</table>
Wash first!

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Recipe ---Removal of mucus and bubble---

• Acetylcysteine mixture
  – 100 ml of water
  – 2 ml of acetylcysteine (200 mg/ml, Parvolex)
  – 0.5 ml (40 mg/ml) activated dimethicone (Infacol)

Hujii T, et al. GIE 1998;47:382-7
Preparing syringe

Dye solution + air
Spraying catheter

Do not fill the catheter with dye solution before handing it to the endoscopist.
Preparation of dyes with foot pump

Water 90ml
Indigo 2ampules
Application with dyespray catheter
Withdrawing the catheter
Other dyes

**Crystal violet**  
In colon

- 0.05% crystal violet
- With non traumatic catheter
- Minimal amount (due to renal toxicity)
- Examine with magnifying endoscopy
Crystal violet & magnifying scope for observation of pit pattern in colorectum
Other dyes

Iodine

- 1% Iodine (3% lugol’s solution)
- Targeted/ pan-oesophageal
- Around 10ml of dye required
- Heart burn (resolved by Sodium thiosulfate)
  - 2.5% Sodium thiosulfate 20-40ml
- Contraindicated use for Iodine allergy patient
Other dyes

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Iodine for oesophageal dysplasia/cancer

- Glycogen rich normal epithelium stains dark brown by iodine
- Poorly or unstained area suggests a pathological change of the mucosa including carcinoma

Courtesy of Dr Noriya Uedo
Other dyes

**Methyline blue**  In oesophageal, stomach, colon

- Contrast method - 0.05%
- Absorptive method - 0.2-1.0%
- Ampule 1%
- blue discolouration of urine and faeces
Absorptive method (vital staining)

- Dye stains epithelial cells by preferential absorption or diffusion across the cell membrane
- **Methylene blue**, crystal violet, etc...

Courtesy of Dr Noriya Uedo
Other dyes

**Acetic Acid**

- Acetic acid 1.5–3%
- Barrett's oesophagus

Pictures from Dr Chedgy FG
Quiz
• Mr Smith had a gastroscopy this morning.
• He contacted to endoscopy reporting after his gastroscopy, he passed green urine.

Has he had dyespray of

A. Indigocarmine
B. Methylene blue
C. Lugol Iodine
Ns Ragunath is spraying dye...

2 points I do not like... which are
Quiz 3

- What dye was used?
- What is the side effect from this dye?
Quiz 4

• I asked Ns Ragunath to prepare indigocarmine solution....

Spot on!
Thank you!