

Instructor template and scoring guide

Knowledge test on urinary, nasogastric, and rectal catheterization

English translation for reference. The Spanish version was the instrument administered.

Instrument used in the present study

The test comprises two parallel 30-item forms: 10 items on urinary catheterization, 10 on nasogastric intubation, and 10 on rectal catheterization.

To assess retention, Forms A and B were administered at two time points (immediately after the Session-2 seminar and four weeks after Session 1), distributed approximately evenly across arms at both administrations.

Scoring: 1 point per correct answer; 0 points for an incorrect or blank answer. Total: 0–30. Subscales: 0–10 per procedure. It can also be expressed as a percentage.

Because the items are multiple-choice with a single correct answer, scoring was automated against this objective key, without requiring a second rater.

The items were developed by the teaching team from the program's learning objectives and its clinical and simulation protocols, and were reviewed by that team for relevance and clarity before use.

Test blueprint

Block	Items	Score	Competencies assessed
Urinary catheterization	1–10	0–10	Indications, aseptic technique, material selection, maintenance, complications, and documentation.
Nasogastric intubation	11–20	0–10	Indications/contraindications, preparation, safe insertion, position confirmation, maintenance, and documentation.
Rectal catheterization	21–30	0–10	Indications/contraindications, privacy, safe technique, complications, infection control, and documentation.
Total	1–30	0–30	Theoretical–procedural knowledge of the three techniques.

Answer key — Form A

Question	Answer	Block	Question	Answer	Block
1	C	Urinary	16	C	Nasogastric
2	B	Urinary	17	B	Nasogastric
3	B	Urinary	18	A	Nasogastric
4	B	Urinary	19	B	Nasogastric

Question	Answer	Block	Question	Answer	Block
5	C	Urinary	20	B	Nasogastric
6	B	Urinary	21	A	Rectal
7	A	Urinary	22	C	Rectal
8	B	Urinary	23	A	Rectal
9	B	Urinary	24	A	Rectal
10	A	Urinary	25	B	Rectal
11	B	Nasogastric	26	A	Rectal
12	A	Nasogastric	27	A	Rectal
13	A	Nasogastric	28	A	Rectal
14	C	Nasogastric	29	A	Rectal
15	B	Nasogastric	30	A	Rectal

Answer key — Form B

Question	Answer	Block	Question	Answer	Block
1	C	Urinary	16	A	Nasogastric
2	B	Urinary	17	B	Nasogastric
3	A	Urinary	18	A	Nasogastric
4	A	Urinary	19	A	Nasogastric
5	A	Urinary	20	A	Nasogastric
6	A	Urinary	21	B	Rectal
7	B	Urinary	22	A	Rectal
8	B	Urinary	23	A	Rectal
9	B	Urinary	24	A	Rectal
10	B	Urinary	25	A	Rectal
11	A	Nasogastric	26	A	Rectal
12	A	Nasogastric	27	A	Rectal
13	A	Nasogastric	28	A	Rectal
14	B	Nasogastric	29	A	Rectal
15	A	Nasogastric	30	A	Rectal

Variable computation for analysis

Variable	Computation	Range
knowledge_total	Sum of correct answers across the 30 items	0–30

Variable	Computation	Range
knowledge_pct	knowledge_total / 30 × 100	0–100
knowledge_urinary	Sum of items 1–10	0–10
knowledge_ng	Sum of items 11–20	0–10
knowledge_rectal	Sum of items 21–30	0–10

Analysis performed in this study

The test was administered immediately after the Session-2 seminar and again four weeks after Session 1. The four-week score was analyzed with ANCOVA adjusting for the immediate score and test version, with cluster-robust inference; 95% confidence intervals and effect sizes are reported.

The delayed OSCE measures retained simulated procedural performance; this written test measures retention of theoretical–procedural knowledge. The two outcomes are reported as distinct constructs.

Reference sources

Centers for Disease Control and Prevention. Guideline for Prevention of Catheter-Associated Urinary Tract Infections: Summary of Recommendations (updated 2024).

National Institute for Health and Care Excellence. Nutrition support for adults: oral nutrition support, enteral tube feeding and parenteral nutrition. Clinical guideline CG32.

NHS England / National Patient Safety Agency resources on nasogastric tube placement safety alerts.

Local institutional teaching and clinical protocols for urinary, nasogastric, and rectal catheterization.