

# Anaesthesia for Urological surgery

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# Urological surgery

## Cystoscopic procedures :

- Flexible cystoscopy
- Rigid cystoscopy

# Urological surgery

## Transurethral resection of the prostate :

1

<b>Procedure</b>	Cystoscopic resection of the prostate using diathermy wire—monopolar/glycine irrigation being replaced by bipolar resectoscopes with saline irrigation
<b>Time</b>	30–90min, depending on size of the prostate
<b>Pain</b>	+
<b>Position</b>	Lithotomy ± head-down
<b>Blood loss</b>	Very variable (200–2000mL), can be profuse and continue post-op. G&S
<b>Practical techniques</b>	Spinal ± sedation is method of choice GA, LMA, and SV GA, ETT, and IPPV

# Transurethral resection of the prostate

## Preoperative :

2

- Check creatinine and Electrolytes .
- Assess the mental state and communication

# Transurethral resection of the prostate

## Perioperative :

3

- Antibiotic prophylaxis usually required.
- Obturator spasm
- Fluid therapy: crystalloid can be used, and never use glucose .

# Urological surgery

## TURP syndrome :

1

- A combination of fluid overload and hyponatraemia,1,2 which occurs when large volumes of irrigation fluid are absorbed via open venous sinuses. This syndrome is far less likely with the use of bipolar resectoscopes and saline irrigation. Laser enucleation has virtually eliminated the risk.

# Urological surgery

## TURP syndrome :

2

- Irrigation fluid must be non-conductive (so that the diathermy current is concentrated at the cutting point) and non-haemolytic (so that haemolysis does not occur if it enters the circulation), and must have neutral visual density, so that the surgeon's view is not distorted. For these reasons, it cannot contain electrolytes but cannot be pure water. The most commonly used irrigant is glycine 1.5% in water, which is hypotonic (osmolality 220mmol/L).
- Some irrigation fluid is normally absorbed, at about 20mL/min, and, on average, patients absorb a total of 1–1.5L, but absorption of up to 4–5L has been recorded. In clinical practice, it is almost impossible to accurately assess the volume absorbed.

# Urological surgery

## TURP syndrome :

3

- The amount of absorption depends upon the following factors:
  - Pressure of infusion—the bag must be kept as low as possible to achieve an adequate flow of irrigant at minimum pressure, usually 60–70cm above bladder, never >100cm. Higher pressures increase absorption
  - CVP—more fluid is absorbed if the patient is hypovolaemic or hypotensive
  - Long duration of surgery and large prostate—problems are commoner with surgery lasting >1hr or with a prostate weighing >50g
  - Blood loss—large blood loss implies a large number of open veins.



# Urological surgery

## TURP syndrome :

4

- TURP syndrome is more likely to occur in patients with poorly controlled heart failure. Do not increase the risks of fluid overload by giving an unnecessarily large volume of IV fluid.
- Glycine is a non-essential amino acid which functions as an inhibitory neurotransmitter, and it is unclear whether glycine toxicity plays a part in the syndrome. Ammonia is a metabolite of glycine and may also contribute to CNS disturbance.

# Urological surgery

## TURP syndrome :

5

- Ensure that the irrigation fluid is changed to saline in recovery to prevent further absorption of hypotonic glycine.
- Signs of pulmonary oedema, cerebral oedema, and hyponatraemia are the usual presenting features. They will be detected earlier in the awake patient. Mortality is high, unless recognized and treated promptly.

# Urological surgery

## TURP syndrome :

6

- Early symptoms include restlessness, headache, and tachypnoea, and these may progress to respiratory distress, hypoxia, frank pulmonary oedema, nausea, vomiting, visual disturbances, confusion, convulsions, and coma. In the anaesthetized patient, the only evidence may be tachycardia and hypertension. Rapid absorption of a large volume can lead to reflex bradycardia. Hypotension can also occur. The diagnosis can be confirmed by low serum  $\text{Na}^+$ . An acute fall to

# Urological surgery

## TURP syndrome :

7

- If detected intraoperatively, bleeding points should be coagulated, surgery terminated as soon as possible, and IV fluids stopped. Give furosemide 40mg, and check serum Na<sup>+</sup> and Hb. Support respiration with O<sub>2</sub> or intubation and ventilation, if required. Administer IV anticonvulsants, if fitting.
- Both severe acute hyponatraemia and over-rapid correction of chronic hyponatraemia can result in permanent neurological damage (most commonly central pontine myelinolysis).

# Urological surgery

## TURP syndrome :

8

- Correction should ideally not be faster than 1.5–2mmol/L/hr for 3–4hr, then 1mmol/L/hr until symptomatic improvement or  $\text{Na}^+ > 125\text{mmol/L}$ .
- Admit to ICU/HDU

# Transurethral resection of bladder tumour :

## Preoperative :

1

- Commonest in smokers—check for CAD and COPD.
- Check Hb—chronic blood loss is common.
- Check renal function.
- Refer to previous anaesthetic charts—many patients have repeated surgery.

# Transurethral resection of bladder tumour :

## Perioperative :

2

- Obturator spasm occurs when the obturator nerve, which runs adjacent to the lateral walls of the bladder, is directly stimulated by the diathermy current. It causes adduction of the leg and can seriously impair surgical access and increase the risk of bladder perforation. It can usually be controlled by reducing the diathermy current.
- Antibiotic prophylaxis

# Transurethral resection of bladder tumour :

## Special considerations :

3

- If using a spinal anaesthetic, ensure block to above T10 .



# Urological surgery

## Nephrectomy and partial nephrectomy :

1

<b>Procedure</b>	Excision of kidney for tumour, other pathologies, or live donor
<b>Time</b>	1–2.5hr
<b>Pain</b>	+++ /++++
<b>Position</b>	Supine or lateral (kidney position)
<b>Blood loss</b>	Depends on pathology, 300 to >3000mL. G&S/X-match, as required
<b>Practical techniques</b>	ETT + IPPV ± thoracic epidural or wound infiltration catheter/PKA/epidural .

# Nephrectomy and partial nephrectomy

## Preoperative :

2

- Check Hb - BP - Renal function - Electrolytes - CXR.

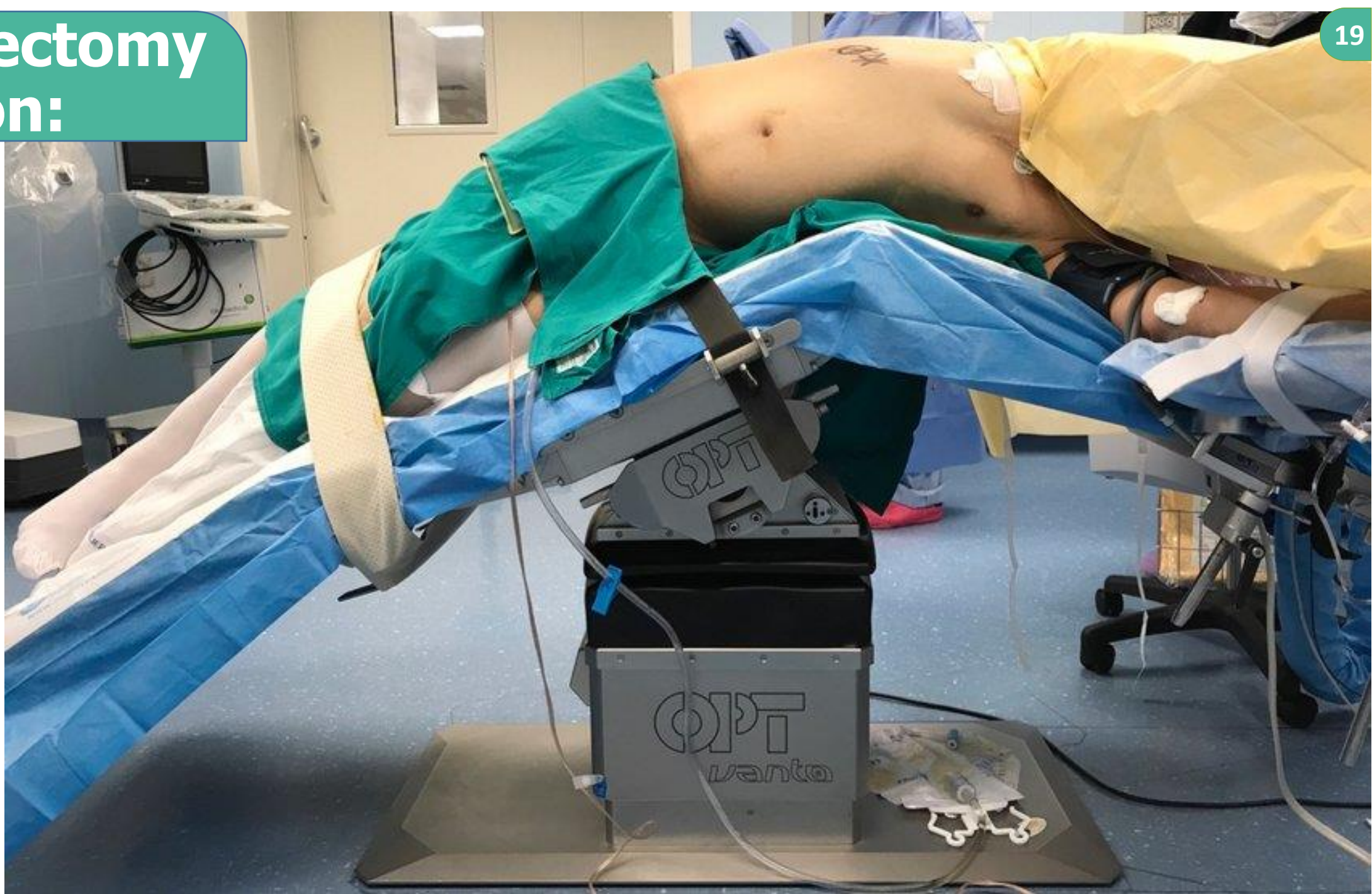
# Nephrectomy and partial nephrectomy

## Perioperative :

3

- Loin incision requires the 'kidney position', i.e. lateral with the patient extended over a break in the table fall in BP .
- Large tumours may need thoracotomy .

# Nephrectomy Position:



# Urological surgery

## Radical cystectomy :

1

<b>Procedure</b>	Excision of bladder plus urinary diversion procedure (e.g. ileal conduit) or neo-bladder reconstruction (orthotopic bladder formation)
<b>Time</b>	3–5hr (longer with bladder reconstruction)
<b>Pain</b>	++++
<b>Position</b>	Lithotomy plus head-down
<b>Blood loss</b>	700 to >3000mL, X-match 4U, use cell salvage.
<b>Practical techniques</b>	ETT, IPPV, art line ± oesophageal Doppler/CVP ± rectus sheath catheters/PCA/epidural

# Cystectomy Position:



# Urological surgery

## Percutaneous stone removal :

2

<b>Procedure</b>	Endoscopic excision of renal stone via Nephrostomy
<b>Time</b>	60–90min
<b>Pain</b>	++/+++
<b>Position</b>	Prone oblique
<b>Blood loss</b>	Variable, 0–1000mL.
<b>Practical techniques</b>	ETT and IPPV

# Percutaneous stone removal

## Perioperative :

1

- Patient initially in the lithotomy position to insert ureteric stents, then turned semi-prone to place nephrostomy posterolaterally below the 12th rib, under radiographic control—potential to dislodge lines and for pressure area damage.
- Consider an armoured ETT to prevent kinking, and secure well. Need to turn the head towards the operative side, so best to position the ETT in the same side of the mouth.



# Percutaneous stone removal

## Special considerations :

2

- Hypothermia can occur if large volumes of irrigation fluid are used.
- Insertion of nephrostomy is often close to the diaphragm, with the possibility of breaching the pleura, causing a pneumothorax or hydrothorax—if in doubt, perform a CXR post-operatively .

# Urological surgery

## Renal transplant :

1

<b>Procedure</b>	Transplantation of cadaveric or live donor organ
<b>Time</b>	90–180min
<b>Pain</b>	++/+++
<b>Position</b>	Supine
<b>Blood loss</b>	Not significant—500mL.
<b>Practical techniques</b>	ETT and IPPV, CVP

# Renal transplant

## Preoperative :

2

- Chronic anaemia is common (Hb usually around 8g/dL). Do not transfuse to normal levels.
- There has usually been recent haemo- or peritoneal dialysis, hypovolaemia and possibly residual anticoagulation.
- Check post-dialysis K<sup>+</sup>. The patient's normal value may be quite high.
- Avoid A–V fistulae when placing the IV cannula. Avoid using a large forearm or antecubital veins, if possible (may be needed for future fistulae).

# Renal transplant

## Perioperative :

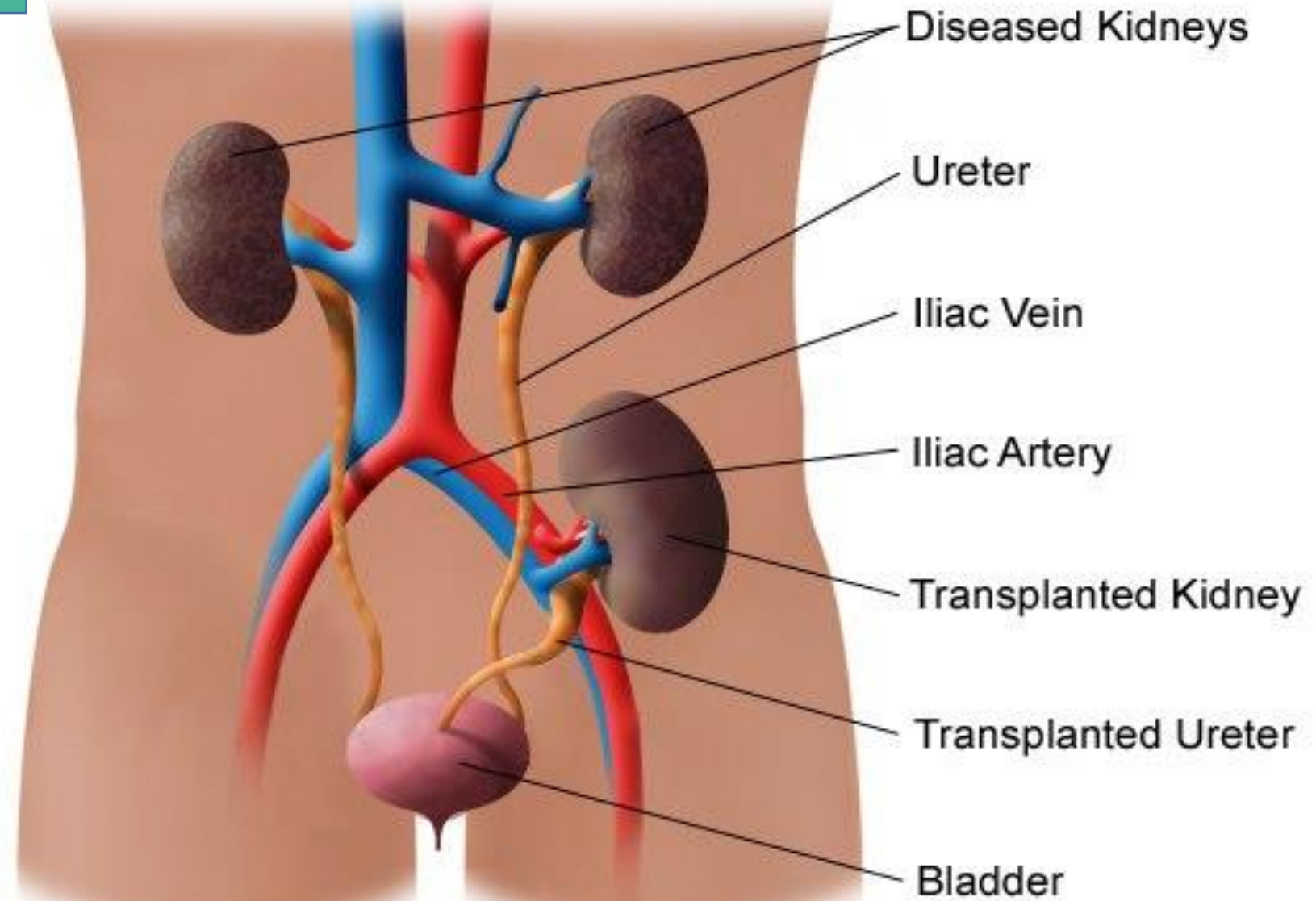
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- Commonly used agents that can be used in renal failure include sevoflurane, atracurium, remifentanyl, and fentanyl.
- Prior to graft insertion, gradually increase CVP to 10–12mmHg (using colloids or crystalloids) .
  - Maintain normothermia.
- Most centres use a cocktail of drugs, once the graft is perfused, to enhance survival (e.g. hydrocortisone 100mg, mannitol 20% 60mL, furosemide 80mg or more).

# Renal transplant Position:

## Example of a Kidney Transplant

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**Thank You**

**End of lecture**