QuES for excellence	Simulation Scenario			
Title	Diabetic Ketoacidosis (DKA) Version		1.4	
Target Audience	FY doctors & student nurses	Run time	10 -15 mins	
Authors	James Jackson, Paul Wilder, Udesh Naidoo, Mark Loughrey	Last review	4/7/18	
Faculty comments	Normal faculty requirements	Necessity	n/a	

## **Brief Summary**

A young diabetic with uncontrolled type 1 diabetes admitted to A&E resus with dehydration, lethargy, anorexia, hyperventilation, abdominal pain. He has ketotic breath, is acidotic and had a blood sugar of 35. His urine contains ketones. After a diagnosis of diabetic ketoacidosis the emergency management of his blood glucose, dehydration and electrolyte imbalance should be addressed. He will deteriorate into coma if management options are not addressed.

## **Educational Rationale**

The scenario evaluates management of the acutely ill patient in need of rapid assessment and management appropriate for the skill grade of an FY doctor. It allows correction of parameters without direct cause and a differential diagnosis can be suggested before senior help arrives.

# Learning Objectives: Nurse

- ABCDE assessment and NEWS scoring of a deteriorating patient
- Initial appropriate management
- Escalation and SBAR handover
- Inter-professional team working

# Learning Objectives: Doctor

- A-E assessment and initial management of a deteriorating patient
- Recognise the signs and symptoms of DKA
- Prescribe appropriate fluid and electrolyte replacement
- Prescribe infusion of insulin in line with trust guidelines
- Appropriate anticoagulation



No	CURRICULUM MAPPING	This scenario
1	Acts professionally	✓
2	Delivers patient-centred care and maintains trust	✓
3	Behaves in accordance with ethical and legal requirements	✓
4	Keeps practice up to date through learning and teaching	✓
5	Demonstrates engagement in career planning	
6	Communicates clearly in a variety of settings	✓
7	Works effectively as a team member	✓
8	Demonstrates leadership skills	✓
9	Recognises, assesses and initiates management of the acutely ill patient	✓
10	Recognises, assesses and manages patients with long term conditions	<b>✓</b>
11	Obtains history, performs clinical examination, formulates differential diagnosis and management plan	✓
12	Request relevant investigations and acts upon results	✓
13	Prescribes safely	✓
14	Performs procedures safely	✓
15	Is trained and manages cardiac and respiratory arrest	
16	Demonstrates understanding of the principles of health promotion and illness prevention	✓
17	Manages palliative and end of life care	
18	Recognises and works within limits of personal competence	✓
19	Makes patient safety a priority in clinical practice	✓
20	Contributes to quality improvement	

# Candidate Briefing: Nurse

Setting

A&E Resus bay

You are an A&E nurse working in resus who has just received 35 year old Jason Bradley in bay 1. He has just been brought in by ambulance having been found at home by his brother drowsy, breathlessness and smelling funny.

The Ambulance crew handed over a bag of medications and says he lives alone and works as a volunteer. They also say he has signs of heavy smoking and appears quite unkempt.

His brother has not yet arrived in the hospital and there is no other history known so the patient paperwork is currently blank.

Please complete your initial assessment and take the necessary actions, acting as you would do normally.

# Candidate Briefing: Doctor

Setting

A&E Resus bay

You are an ED Doctor working in A&E Resus. Please wait as directed until you are called by the nurses who are undertaking a patient assessment, and then act as you would do in real life including receiving an SBAR handover from them.

Technical set-up						
Setting	Setting A&E Resus bay					
Simulator	Simulator Manikin					
Gender	Male	Age	35			

Initial monitor parameters						
RR	O2 sats	ВР	ECG rhythm			
31	95% on air	110	98/55	Sinus tachy		
Cap Refill Time	Blood glucose	Temp.				
4s	35	36.5				

Initial patient set-up					
A improve	Obstruction	Airway adjunct			
Airway	No	No			
Droothing	Chest sounds	O2 supply			
Breathing	Normal	Air			

Circulation	Cannula	BP cuff	Peripheries / pulses
	No	No	cool

Disability	Eyelids	Pupils	AVPU/GCS	
Disability	Open to voice	React normally	V / 12	

Evnocuro	Posture	Moulage		
Exposure	Sitting at 45 degrees	No		

## Specific equipment / prop requirements

- Monitoring BP cuff, sats probe, ECG monitoring
- Airway Nasal O2, Venturi masks, Hudson mask, Guedel, nasopharyngeal airway
- Crash Trolley and defibrillator
- Partially completed A&E casualty card
- Initial obs chart filled in
- Patient name band
- ABG on request
- CXR on request
- DKA protocol

#### Drugs available:

- Oxygen
- Insulin sliding scale
- Fluids (crystalloid/colloid)
- Potassium
- Bicarbonate
- All pain killers
- LMWH

# **Facilitator Briefing**

#### Telephone Advice

Encourage a handover using the SBAR tool (Situation/ background / assessment/recommendations).

If the candidate is struggling with diagnosis/management then some clues can be given. Please treat scenario as real as possible. For example:

- Talk about examination findings or lack of history
- Ask them why they would be on certain medications?
- Ask them to analyse ABG/urinalysis/ECG/bloods over the phone?
- Encourage them to download protocol from intranet and prescribe as necessary
- If appropriate then candidates can be pushed for differential diagnosis

Advise them that you cannot come immediately. They are allowed to call you back!

#### **CONDUCT**

- You will be sitting in the control room for the duration\_
- Answer all calls as "switchboard" in the first instance to allow for realistic delay. Call back after 1 2 minutes
- The Medical Registrar should sound busy and state they are tied up with another patient
- They should be helpful but press the candidate hard about what assessment has been performed e.g. nature of pain, findings of physical examination
- If the candidate is not armed with the information, tell them to get the required info and call you back

# How to run with candidates from only one discipline

An additional member of faculty can play the role of the nurse in this scenario if needed.

#### Sim Nurse briefing:

You are an A&E nurse working in Resus who has just received 35 year old Jason Bradley in bay 1 and have not managed to take any observations. You have contacted the doctor to come immediately as you are concerned he smells funny, is confused and drowsy.

He has a bag of medications with him - (short and long acting insulin, lansoprazole and fluoxetine).

He lives alone and works as a volunteer. He has signs of heavy smoking and is quite unkempt. His brother called the ambulance but has not yet arrived in the hospital and there is no other history known at this point when you call the candidates.

Observations will deteriorate if management is not implemented. He will remain the same if appropriate management is given.

#### **CONDUCT**

Throughout the scenario you should act as a "competent robot" i.e. you should perform all tasks requested to the best of your ability, but should not initiate any treatment on your own. If you are not being effectively instructed by the candidate, you may be prompted via your ear piece by the lead facilitator as to what your next action should be.

If you strongly disagree with management then you are free to question them, stating your reasons.

If asked to give drugs, you should request that they are prescribed on the drug chart. If they are unsure of the dosage please refer them to the BNF or Hospital Guidelines App or via Intranet.

Patient Briefing			
Setting	A&E resus		
Name	Jason Bradley		
Age	35		
Gender	Male		

## What has happened to you?

You are confused and unable to provide a history.

You have been eating irregularly and have not been taking you insulin routinely over the last few days.

## How you should role-play

Confused with eyes opening to voice and localising to painful stimulus initially (E3V4M5). You appear short of breath and if aroused all you want is a drink.

If candidate initiates treatment with fluid and insulin then you remain the same. If fluid and insulin not prescribed then you become progressively worse over a period of 5 mins to the point where you open your eyes to pain, grunting noises only and localise to pain (E2V2M5).

Allow candidate to examine you and nurse to put monitoring on without upset.

### Your background

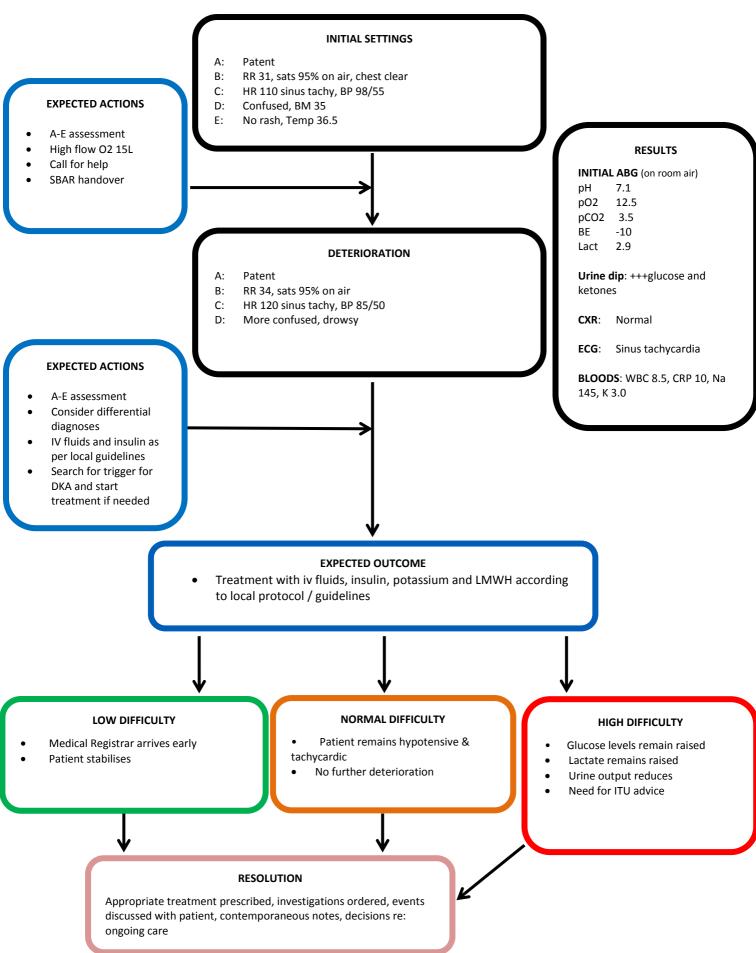
#### PMH

- Type 1 DM poorly controlled
- Depression
- GORD
- Multiple admissions to hospital with similar presentation

#### SH

- Smoker 10 cigarettes / day (10 years)
- ETOH 30 units/week
- Lives alone in flat
- Works as a volunteer

# Scenario flowchart



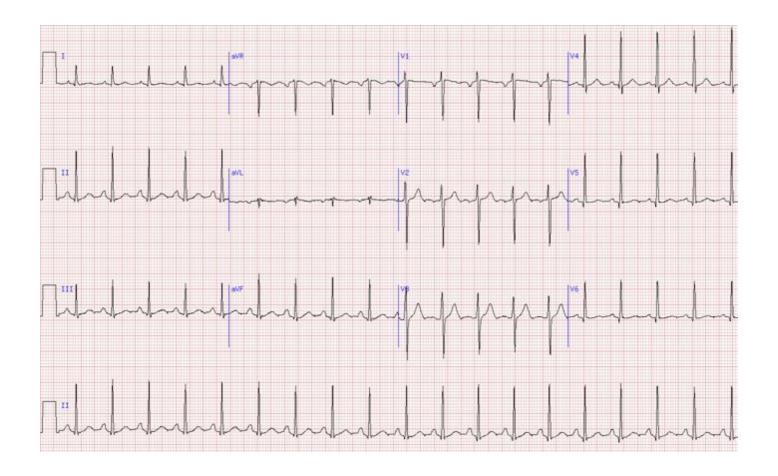
# References

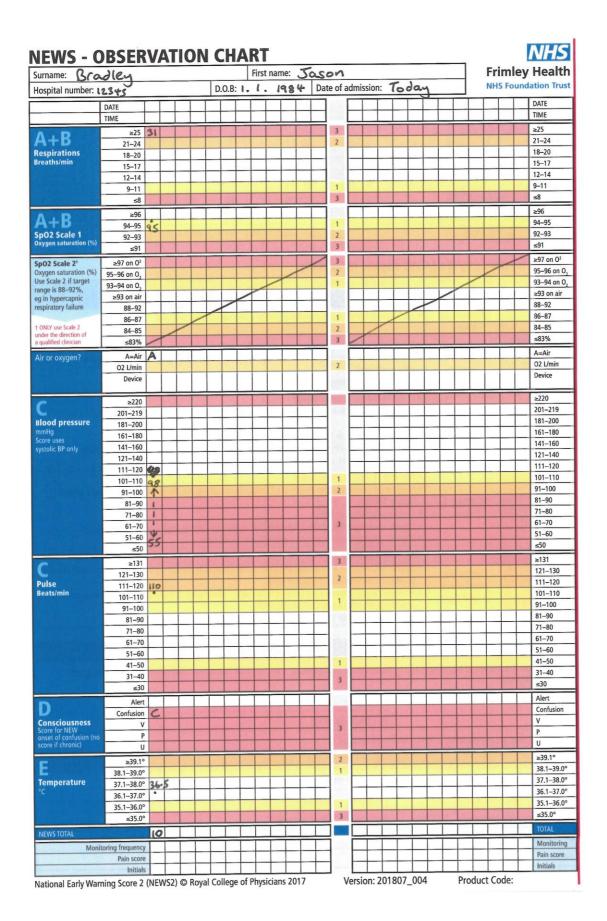
- Joint British Diabetes Societies Inpatient Care Group: The management of diabetic ketoacidosis in adults. March 2010. https://www.diabetologists.org.uk/JBDS\_DKA\_Management.pdf
- ABCD guidelines for the management of hyperglycaemic emergencies in adults. June 2006. Found at: <a href="https://www.diabetologists.org.uk/Shared\_Documents/position\_papers/Position\_Paper\_on\_Hyperglycaemic\_Emergencies.pdf">https://www.diabetologists.org.uk/Shared\_Documents/position\_papers/Position\_Paper\_on\_Hyperglycaemic\_Emergencies.pdf</a>

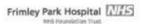
# Clinical props

Specific Gravity	1.015	
PH	6.0	
Leukocytes	Neg	
Blood	Neg	
Nitrites	Neg	
Ketones	+++	
Protein	+	
Glucose	+++	

	ntificati	ons	789987						
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i	pCO		3.50	kPa	1	4.70		6.00	1
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Ox	imetry	Values	1.00						
	ctHb		16.5	g/L					
FO,Hb		75.0	%	[	94.0	-	98.0	1	
sO <sub>2</sub>		76.0	%						
FCOHb		1.0	%	[	0.5	-	1.5	1	
	FHH	b	3.5	%	1	0.0	-	5.0	1
FMe:Hb		1.0	%	1	0.0	-	1.5	1	
Ca	lculate	d Values							
	cBas	e(Ecf)c	-10.0	mmol/L					
cHCO <sub>3</sub> -(P)c		14.0	mmol/L						
Ele	ectrolyt	e Values							
	cNa*		145	mmol/L	1	136		146	1
l	cK*		3.1	mmol/L	1	3.4		4.5	1
	cCl-		100	mmol/L	1	98		106	1
	cCa <sup>2</sup>	*	1.20	mmol/L	1	2.2		2.45	1
		n Gap <sub>c</sub>		mmol/L					
Me	etabolit	e Values							
t	cGlu		35.0	mmol/L	1	3.9		5.8	1
1	cLac	:	2.9	mmol/L	1	0.5		1.6	1
cCrea		80	µmol/L	1	44		97	1	
Not									
†	69	Value(s)	hove refe	rence range					
1				ence range					
C			i value(s)						







Patie	ent Name JASON BRADLE	Y
Patie	ent Number 789987	
NHS	number	
DOE	1	
Date		

#### Diabetic Ketoacidosis Monitoring Chart

Hours	Time	Neuro GCS	Glucose mmol/I (bedside meter)	Venous Glucose mmol/L (gas analyser/ lab) *	Insulin Units/hr	Blood ketones mmol/L	Urine ketones	pН	K <sup>†</sup>	Fluid in mL/hr	Fluid out mL/hr	Cumulative balance
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· Until pH normal, use of bedside glucose meters is contraindicated

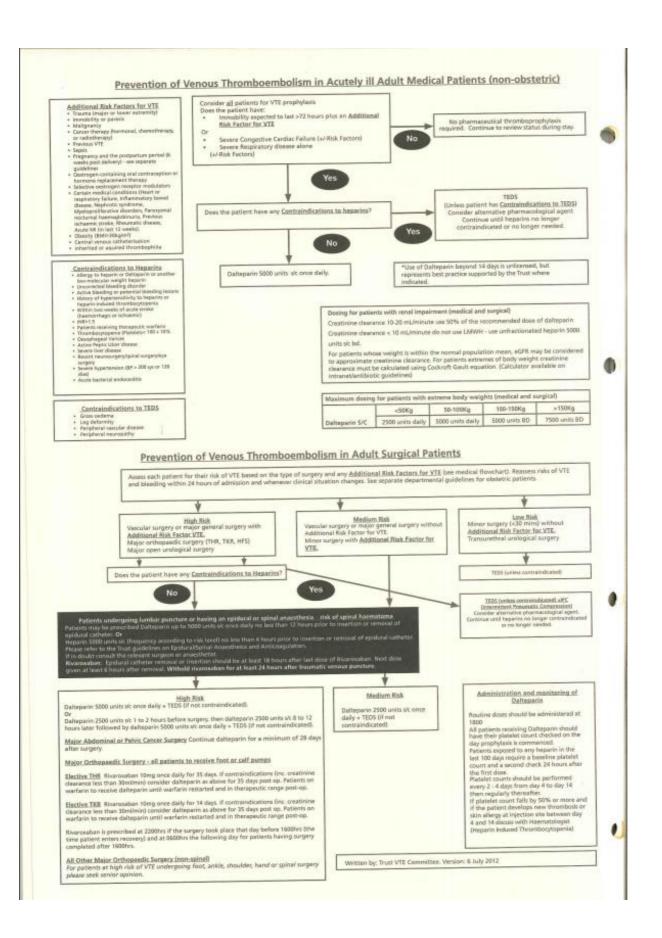
Frimley Park Hospital	NHS
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Postcode: Tel (H): Tel (M):			NOK: Address:				
Employer / Educ. E Religion: Language:	•		Relationshi Tel (H): Tel (M):	ip:			
Date of Arrival: Time of Arrival: Mode of arrival: No of Attendances Previous Attendance	in past year:	2	GP: Address: Tel No: Fax No:				
To be seen in:	12.71						
Speciality Expected Specialty:	i:	Time referred to Time seen:	specialty:		Duty/On-		rgency Department ultant:
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Triage Nurse:	29000	-		-			
Presenting Complaint:	The last			Tria	e of Triage: ge (ESI)	3	
History of Presenting Co				Pai	n Score		
On Assessment: Previous Medical History	÷			Alle	rgies	129.	The state of the s
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					riage eatment		
				Trie	age Notes		
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Frimley Park Hosp	
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FPH40 CSP 03/11



## RISK ASSESSMENT RECORD SHEET FOR VENOUS THROMBOEMBOLISM (VTE)

- Please use in conjunction with Trust guidelines overleaf
   Please see separate Trust guidelines for obstetric patients

Thrombosis Risk	Patient Related	Procedure Related	Assessment	Assessment at 24 hours	Assessment	Assessmen
High	Previous VTE					
	Immobility expected to test >72 hours					
	Malignancy					
	Acute or chronic lung disease					
	Acute or chronic inflammatory disease	1				
	Chronic heart failure	-	-			
	Lower limb paralysis (excluding acute					
	stroke) Acute infectious disease, e.g.					
	pneumonia					
	BMI >30kg/m2					
	Inherited or acquired thrombophilip					
	Pregnancy or less than 6 weeks post parture					
	1	Hip or Knee replacement				
		Hip fracture				
		Other major orthopaedic surgery				
		Surgical procedure tasting >30mins with additional VTE risk factor(s)				
Medium	Oestrogen containing oral contraception or HRT	The second of th				
	Selective destrogen receptor					-
	modulators	-	_			
	Age > 60					
	Dehydration					
	Varicose vains with phiebits					
		Mirror surgical procedure with additional VTE risk factor(s)				
		Surgical procedure lasting >30mins				
		with no additional VTE risk factors  Plaster cast immobilisation of lower				
Low		limb .				
	None of above	None of above				
Bleeding Risk/ Contraindications	Patient Related	Procedure Related				
CONTRACTOR CONTRACTOR	Haemophilia or other known bleeding					
	disorder Thrombocytopenia (Platelets < 100 x					
	10 <sup>5</sup> /L) Within two weeks of acute stroke					
	(haemorrhagic or ischaemic)					
	Severe hypertension (BP > 200 systolic or 120 diestolic)					
	Severe liver disease					
	Oesophageal Varices					
	Active Peolic User disease					
	Active bleeding or potential bleeding					
	lesions Major bleeding risk, existing anticoagulant therapy					
	Severe renal disease					
		Neurosurgery, spinal surgery or				
		eye surgery				
		Other procedure with high bleeding risk				
		Lumber puncture/spinariepidural in previous 4 hours or anticipated in				
tisk assessment pe	rformed by	next 12 hours				
lignature						
and of Bully of Info	rmation Leaflet given to patient		Yes No			

Page 18 For Simulation use only

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POD H POD W  WHEN RE  DRUG (Approved no  DOSE ( UNITS)  PRESCRIBERS  SPECIAL INSTRUCTION  PHARMACY  DRUG (Approved no  DOSE ( UNITS)  PRESCRIBERS	ROUTE S/C GMC No.  ROUTE S/C GMC No.	PREQUENCY PREQUENCY	Time DGSE (In Uhi Rouse Siven by Dete Time	nta)			113			
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New	Previous Admission				

C. Diff Status

New	Previous Admission

ONCE DAILY GENTAMICIN PRESCRIPTION	
Use gentamicin calculator or intranet to calculate dose.	
Level must be taken 6 to 14 hours after the first dose has been	given.

Specify Dosing Regime 5mg/kg Indication:					3mg/kg		Other					
to be	Time to be given	Dose (mg)	Prescribers signature GMC No.	Date of sig.	Start time of infusion	Given by: (sign)	Dute and Time blood level taken sign:	Gentamicin Levels mg/l				

#### General Guidance

- All antimicrobial prescriptions MUST follow the Trust's Antimicrobial Policies or MUST have been agreed by Microbiology. See full up to date policy on intranet.
- INDICATION, STOP AND REVIEW DATES MUST BE RECORDED ON THE CHART.
- CURB 65 score MUST be recorded for all community acquired pneumonia.
- Check previous relevant microbiology results before prescribing antibiotics and check new microbiology results daily. If a patient is not responding to treatment seek advice from a consultant microbiologist.
- Doses need to be adjusted to suit patient's age, size and renal function. To calculate creatinine clearance use calculator on intranet and see dose adjustments for antibiotics.
- All IV regimes MUST be reviewed at 48 hours and switched to oral if appropriate.

#### IV SWITCH GUIDELINES

If YES to all, consider change to ORAL	If YES to any, remain on IV							
Patient able to swallow and tolerate oral fluids?	Oral route compromised?							
Temperature settling and < 38°C for at least 48hrs?	Continuing serious sepsis?							
Heart rate <100bpm for last 12hrs? (no unexplained tachycardia)	Febrile with neutropenia?							
WCC between 4-12x10 <sup>9</sup> /L?	Specific indication / deep seated infection. (Meningitis, endocarditis, encephalitis, osteomylisis,							
Oral formulation available?	(Meningitis, endocarditis, encephalitis, osteomylitis, neutropenia, cystic fibrosis, septicaemia, haematology/ immunocompromised pts, continuing sepsis, other severe infections as discussed with microbiology.) Seek microbiology advice if unsure.							
Others markers: BP stable Respiratory rate <20 breaths/min CRP returning to normal and less than 100 (adult)								
Absence of mental confusion (when representing symptoms of infection)	No oral formulation available (seek microbiology advice on alternative)							

Start	time/stop chec							
Signature								
ther or	Duration of infusion							
Complete either or	Rate							
South		1						
	volume							
DRUGS TO BE ADMINISTERED BY INTRAVENDUS / SUBCUTANEOUS INFUSION								
MINISTERED BY INTRAVENO								
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