

# THE NEW UKRAINIAN CLINICAL ALGORITHM FOR SEVERE PREECLAMPSIA CAN IMPROVED PERINATAL OUTCOMES

**Prof. DG Konkov** National Pirogov Memorial Medical University, Vinnytsya 

**Prof. VI Medved** SI «Institute of Pediatrics, Obstetrics and Gynecology, NAMS of Ukraine», Kyiv 

**Associate professor VV Klivak** National Pirogov Memorial Medical University, Vinnytsya 

**Associate professor SM Kosianenko** National Pirogov Memorial Medical University, Vinnytsya 

**PhD student O Bondarchuk** National Pirogov Memorial Medical University, Vinnytsya 



**Preeclampsia (PE)** is main cause of morbidity and mortality both mother and fetus. Preeclampsia occurs in 3- 12% of pregnancy and that was no changed during the last century. Advances in obstetrics and neonatology have substantially mitigated many of the adverse pregnancy outcomes related to PE. The PE encompasses 2% to 8% of pregnancy-related complications, greater than 50,000 maternal deaths, and over 500,000 fetal deaths worldwide. According to Ukraine statistic data for 2020: the incidents of hypertension in pregnancy in 21,004 women (74.57 per 1,000 births), including preeclampsia and eclampsia in 11,075 women (39.32 per 1,000 births), of which severe preeclampsia and cases of eclampsia in 1,573 women (5.58 per 1,000 births). The early multi-disciplinary management are essential to prevent morbidity and mortality associated with preeclampsia..

**Material and Methods.** The new version of the Ukrainian National Clinical Guideline and Clinical Protocol "Hypertensive disorders during pregnancy, childbirth and the postpartum period" 2022 presents a synthesis of the scientific evidence that is relevant to the concerning severe PE treatment strategies. The current algorithm was performed at the National Pirogov Memorial Medical University, Vinnytsya, Ukraine, under budget grant No. 0121 U109141.

**Results.** We presented the new algorithm of clinical management for severe pre-eclampsia "CALM DOWN" that implemented to the new Ukrainian clinical protocol of primary, secondary (specialized) and tertiary (highly specialized) medical care. CALM DOWN is the special mnemonic that means "step by step strategy" for the medical teamwork (Figure 1).

## Results (continue)

"C" is Calling for help (duty doctors, anaesthetist, and paediatrician (as required), with fixation of actual time) - 1-3 min.

"A" is Assessment (assess the airway, auscultation, re-measure blood pressure, pulse rate, oxygen saturation, fetal heartbeats, assess the patient consciousness) - 3-5 min. Measuring BP using different blood flow sounds - Korotkoff phase IV (K4, softer, muffled sound) compared with Korotkoff phase V (K5, when the sound disappears) to measure diastolic BP. There may be little to no difference between using K4 or K5 to diagnose pre-eclampsia - the evidence is uncertain.

"L" is Low blood pressure (antihypertensive therapy, commence if: sBP  $\geq$  160 or dBP  $\geq$  110 mmHg and consider if: sBP is persistently greater 140 or dBP is persistently greater 90 mmHg. Aim for gradual and sustained lowering of BP, so blood flow to the fetus is not compromised. Infusions of glyceryl trinitrate are recommended only when other treatments have failed and birth is imminent) - 5-10 min.

"M" is Magnesium (loading dose of 4 g should be given intravenously over 10 to 15 minutes, followed by an infusion of 1 g/hour maintained for 24 hours. If preeclampsia is evident with central nervous system dysfunction, magnesium sulfate is recommended during the antepartum, intrapartum and for the first 24 h postpartum periods) 10-15 min.

Pause is evaluated on the effectiveness of prescribed medications (target BP: sBP range of 130 to 150 mmHg; dBP range 80 to 90 mmHg) - 5-10 min.

Consider magnesium sulfate therapy, and corticosteroids where appropriate prior to transferring women with severe pre-eclampsia or HELLP syndrome) - 5-10 min.

"D" is Decision (decide about further management: transfer to the intensive care unit or operating theatre or delivery room, depending on gestational age and patient's condition.

"O" is Oliguria (fluid restriction in preeclampsia is recommend no more than 60-80 mL/h of IV fluids. Consider additional fluid administration only prior to intravenous urapidil, regional anaesthesia, immediate delivery, or in oliguric patients where a volume deficit is suspected. If no fluid deficit is apparent and if no other complications (e.g. postpartum haemorrhage), restrict post-birth intravenous crystalloids to 1500 mL in the first 24 hours) - 5-10 min.

"W" is fetal Wellbeing (continuous CTG monitoring and Doppler assessment) - 10-30 min. Signs of fetal compromise: umbilical artery (UA) flow Doppler - UA pulsatility index greater than 95th centile (early or late FGR), severe if absent or reversed end diastolic flow; Ductus venosus Doppler - absent or reversed "a" wave, identification of an abnormal ductus venosus waveform is not diagnostic in isolation when there is no other Doppler abnormality; middle cerebral artery Doppler - cerebral redistribution (decreased resistance or 'brain sparing effect'), paradoxically the flow can revert back to a high resistance pattern when the pathology has not yet resolved—this is a very poor prognostic sign and not diagnostic when used in isolation.

"N" is parturition, timing of birth is dependent on the severity of the disease and the gestational age at which it presents (birth, regardless of gestational age (prolongation of pregnancy carries no benefit for the woman but may be desirable at early gestations to improve the fetal outcomes and prognosis), is the definitive management and is followed by resolution of all components of pre-eclampsia, generally over a few days but may take up to 3 months. Recommend vaginal birth unless a caesarean section is required for other obstetric indications. If vaginal birth is planned and the cervix is unfavorable, recommend cervical ripening to increase the chance of successful vaginal birth). Requires a multidisciplinary team approach with continual consultation and agreement with the woman.

Mnemonic	Definition	Action of personnel	Optimal time
<b>C</b>	Calling for help	Calling on duty doctors, an anesthesiologist at the onset of symptoms of severe preeclampsia, with fixation of actual time.	1-3 min
<b>A</b>	Assessment	Check the airway, auscultation of the lungs, re-measure blood pressure, heart rate, assess the oxygen saturation, fetal heart beats, assess the patient's consciousness.	3-5 min
<b>L</b>	Low blood pressure	Antihypertensive therapy: nifedipine 10 mg p.o., urapidil 10 mg IV	5-10 min
<b>M</b>	Magnesium sulfate	Intravenous therapy is with a loading dose of 4 g of diluted magnesium sulphate (in 50 ml).	10–15 min
	Pause	Evaluate the effectiveness of prescribed medications. Target BP: sBP range of 130 to 150 mmHg; dBP range 80 to 90 mmHg.	5-10 min
<b>D</b>	Decision	Decide about further management. Transfer to the intensive care unit or operating theatre or delivery room, depending on gestational age and patient' condition.	5-10 min
<b>O</b>	Oliguria	Women with severe preeclampsia immediately prior to regional anesthesia or immediate delivery: 250 mL bolus. Fluid restriction in pre-eclampsia is recommended no more than 60-80 mL/h of IV fluids.	5-10 min
<b>W</b>	Fetal Well being	Continuous CTG monitoring and Doppler assessment.	10-30 min
<b>N</b>	Parturition	All women with severe pre-eclampsia or eclampsia should be delivered within 24 hours, regardless of gestational age.	

## Conclusion

We have proposed the algorithm "CALM DOWN" for the optimal timing of severe PE, offers to systematize the participation of each member of the team in the provision of emergency care and should be implemented in clinical practice based on the peculiarities of the specifics of work, resources, functioning and localization of the maternity facilities when forming personal route of the patient.