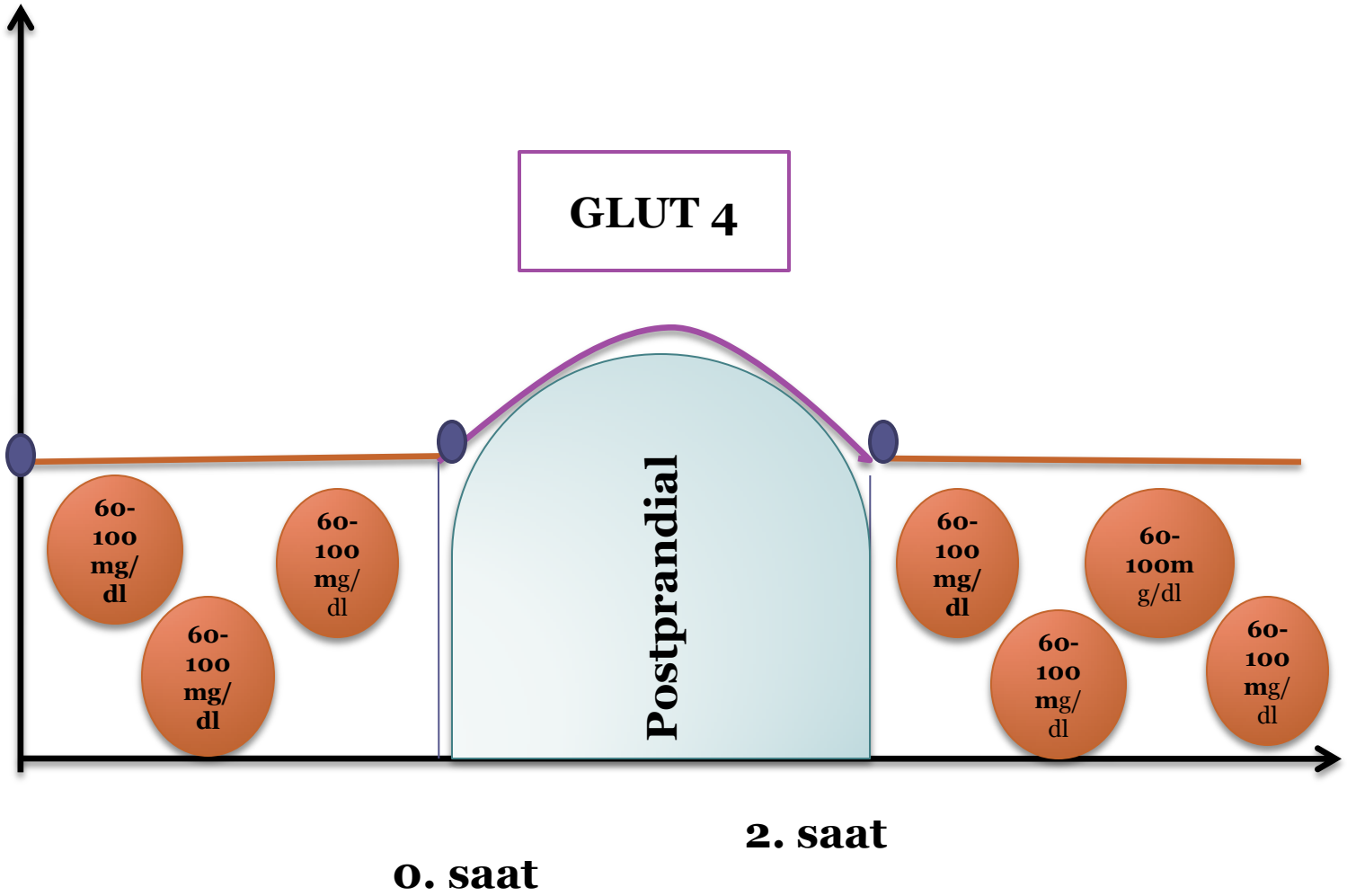
KAN ŞEKERİ YÜKSEKLİĞİ

Doç. Dr. Murat AYAN
Gaziosmanpaşa Üniversitesi Tıp Fakültesi Acil Tıp AD

SUNUM PLANI

- Tanım
- Genel Bilgi
- Kan Şekeri Yüksekliği Yapan Durumlar
- Hiperglisemik Kriz Yapan Durumlar
- Fizyopatoloji
- Tanı
- Tedavi Algoritmaları
- Özet


GLUT 4
Postprandial
60-100 mg/dl
60-100 mg/dl
60-100 mg/dl
60-100 mg/dl
60-100mg/dl
60-100 mg/dl
60-100 mg/dl
2. saat
0. saat

TANIM-1

A. Açlık plazma glukoz değerlerine göre;

- Açlık plazma glukozu <100 mg/dl = normal
- Açlık plasma glukozu 100-125 mg/dl = bozulmuş açlık glukozu
- Açlık plazma glukozu ≥126 mg/dl = diabetes mellitus

TANIM-2

- **B. OGTT değerlerine göre;**

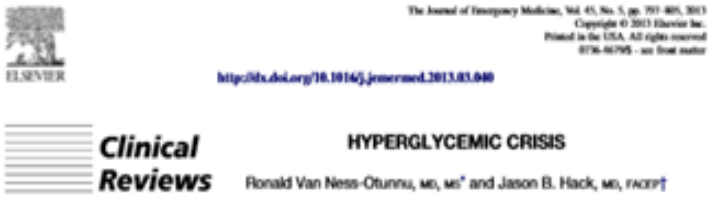
- 2. saat plazma glukozu <140 mg/dl = normal

- 2. saat plazma glukozu 140-199 mg/dl = bozulmuş glukoz toleransı

- 2. saat plazma glukozu ≥ 200 mg/dl = diabetes mellitus

- Acil Servislerde Kırmızı Çizgimiz; Kan Glukozunda

GENEL BİLGİ



- Hiperglisemik aciller kontrol edilmemiş Tip I ve Tip II DM ile ilişkilidir.
- Şok, koma, ölüm gibi hayatı tehdit edebilen endokrin acillerdir.
- Dünyada 2010 yılında 285 milyon DM, ortalama maliyeti yıllık 376 milyar dolardır.

- Mortalite oranları yüksektir.
- DKA: % 1-9
- HHS: %5-45
- MİX TİP(DKA/HHS): %5-25

Diabetes Care. 2006 Sep;29(9):2018-22.

Declining death rates from hyperglycemic crisis among adults with diabetes, U.S., 1985-2002.

Wang J[1], Williams DE, Narayan KM, Geiss LS.

FİZYOPATOLOJİ

İnsülin eksikliği

↓

Lipoliz ↑

↓

Serbest yağ asit ↑

↓

Keton cisim ↑

DKA

Glukagon
Katekolamin,
Kortizol,
GH
↑

↓

Protein sentezi ↓

Protein yıkımı ↑

Glikojenoliz ↑

Glikoneogenezis ↑

↓

Hiperglisemi

↓

Glikozüri

↓

Dehidratasyon

İnsülin kısmi eksikliği veya reseptör direnci

↓

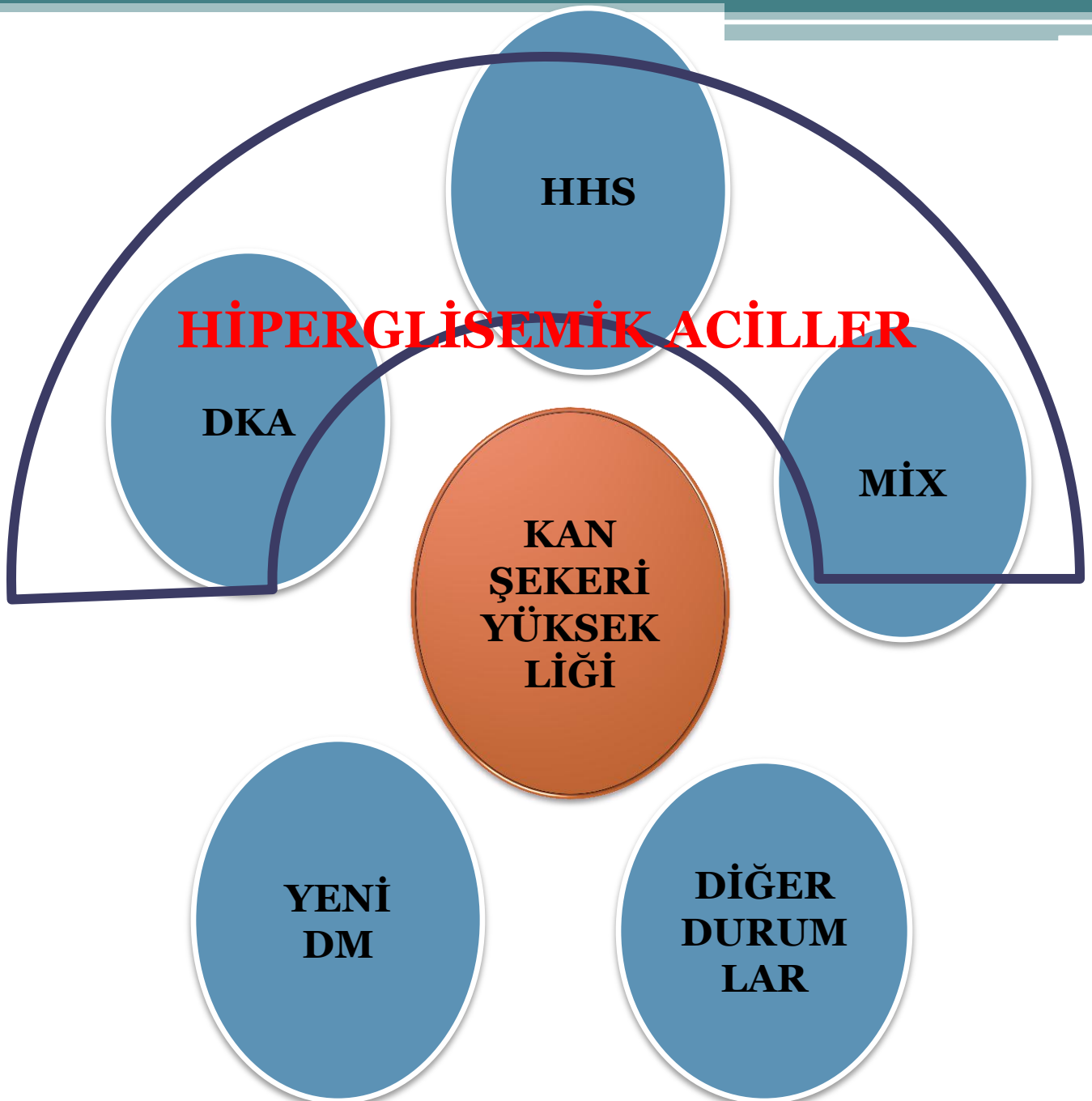
Keton(-) veya minimal ketozis

Asidoz (-)

↓

Hiperosmolarite

HHS


HHS
HİPERGLİSEMİK ACİLLER
DKA
MİX
KAN ŞEKERİ YÜKSEKLİĞİ
YENİ DM
DİĞER DURUMLAR

DKA

- Hiperglisemi
- Metabolik asidoz
- Ketonemi

2014 UP TODATE

Diagnostic criteria for diabetic ketoacidosis (DKA) and hyperosmolar hyperglycemic state (HHS)

	DKA			HHS
	Mild	Moderate	Severe	
Plasma glucose (mg/dL)	>250	>250	>250	>600
Arterial pH	7.25 to 7.30	7.00 to 7.24	<7.00	>7.30
Serum bicarbonate (mEq/L)	15 to 18	10 to <15	<10	>18
Urine ketones*	Positive	Positive	Positive	Small
Serum ketones - Nitroprusside reaction	Positive	Positive	Positive	Small
Serum ketones - Enzymatic assay of beta hydroxybutyrate (normal range <0.6 mmol/L)	<0.6 mmol/L	0.6 to 2.0 mmol/L	2.0 to 5.0 mmol/L	>5.0 mmol/L
Effective serum osmolality (mOsm/kg)Δ	Variable	Variable	Variable	>320
Anion gap◇	>10	>12	>12	Variable
Alteration in sensoria or mental obtundation	Alert	Alert/drowsy	Stupor/coma	Stupor/coma

* Nitroprusside reaction method.
Δ Calculation: 2[measured Na (mEq/L)] + glucose (mg/dL)/18.
◇ Calculation: (Na+) - (Cl- + HCO3-) (mEq/L). See text for details.

Graphic 72111 Version 3.0

HİPEROSMALAR SENDROM

- Hiperglisemi
- Non-asidoz
- Non-ketonomi
- Hiperosmolarite

2014 UP TODATE

Diagnostic criteria for diabetic ketoacidosis (DKA) and hyperosmolar hyperglycemic state (HHS)

	DKA			HHS
	Mild	Moderate	Severe	
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◇ Calculation: (Na+) - (Cl- + HCO3-) (mEq/L). See text for details.

MİKS TİP(DKA +HHD)

DKA

PH<7.3, HCO3<18m mmol/L, pozitif keton

HHS

Serum osmolaritesi >320mOsm/ Kg

American Journal of Emergency Medicine 31 (2013) 830–834

Contents lists available at SciVerse ScienceDirect

American Journal of Emergency Medicine

journal homepage: www.elsevier.com/locate/ajem

Original Contribution

Predicting the hyperglycemic crisis death (PHD) score: a new decision rule for emergency and critical care

Chien-Cheng Huang MD [a,b], Shu-Chun Kuo MD [c,d], Tsair-Wei Chien MBA [e,f], Hung-Jung Lin MD, MBA [a,g], How-Ran Guo MD, MPH, ScD [h], Wei-Lung Chen MD, PhD [i,j], Jiann-Hwa Chen MD [i,j], Su-Hen Chang MD [i,j], Shih-Bin Su MD, PhD [b,k,*]

YENİ TANI DM

- Kan Şekeri Yüksekliği
- HemoglobinA1c %6,5 Üzerinde
- *Enfeksiyon(pnomoni, İYE)*
- *Kardiovasküler hadiseler*
- *SVO*
- *Travma*
- *Pankreatit*
- *İlaçlar*

Diabetes Care. 2009 Jul;32(7):1335-43. doi: 10.2337/dc09-9032.

Hyperglycemic crises in adult patients with diabetes.

Kitabchi AE[1], Umpierrez GE, Miles JM, Fisher JN.

DİĞER DURUMLAR

- Metabolik sendromlar
- İlaç etkileri(steroid, siklosporin)
- Adrenal glandı etkileyen endokrin hastalıklar
- İntoksikasyonlar: salisilat , Ca kanal blokerleri toksisitesi

METABOLIK SENDROM

- İnsülin direnci zemininde gelişen hetorejen bir hastalıktır.
- Abdominal obesite
- HT
- KAH
- Dislipidemi gibi sistemik bozuklukların eklendiği ölümcül bir endokrinopatidir.

Metabolic Syndrome/Insulin Resistance Syndrome/Pre-Diabetes

ORIGINAL ARTICLE

DIABETES CARE, VOLUME 28, NUMBER 11, NOVEMBER 2005

Prevalence of the Metabolic Syndrome Defined by the International Diabetes Federation Among Adults in the U.S.

İNTERNATIONAL DIABETES FOUNDATION(IDF)-2005, METABOLIK SENDROM TANı KRITERI

- Abdominal obezite (Bel çevresi: Avrupalı erkeklerde ≥ 94 cm, kadınlarda ≥ 80 cm)

ve

Aşağıdakilerden en az ikisi

- Trigliserid ≥ 150 mg/dl
- HDL: erkekte < 40 mg/dl, kadında < 50 mg/dl
- Kan basıncı ≥ 130/85 mmHg
- Açlık kan glukozu ≥ 100 mg/dl veya Tip 2 DM

METABOLİK SENDROM KILAVUZU 2009

İNTOKSİKASYONLAR

- Hiperglisemi
- Normoglisemi
- Hipoglisemi

Aspirin ve Salisilat Zehirlenmeleri

- Glikojen depolarının mobilizasyonu
- Glikoneogenezin inhibisyonu

- ***Tintinalli's Emergency Medicine: A Comprehensive Study Guide, 7e,Judith E. Tintinalli, J. Stephan Stapczynski, O. John Ma, David M. Cline, Rita K. Cydulka, Garth D. Meckler, The American College of Emergency Physicians; Section15; Toxicology; 2010***

İNTOKSİKASYONLAR

Kalsiyum Kanal Bloker Zehirlenmeleri

- Genellikle hiperglisemi olur.
- Pankreas Beta ada hücrelerinden Ca aracılı insülin salınımını inhibe eder.
- Karbonhidrat kullanımını inhibe eder.
- Tam anlaşılamamış bir mekanizma ile insülin direncini artırır.

- ***Tintinalli's Emergency Medicine: A Comprehensive Study Guide, 7e,Judith E. Tintinalli, J. Stephan Stapczynski, O. John Ma, David M. Cline, Rita K. Cydulka, Garth D. Meckler, The American College of Emergency Physicians; Section15; Toxicology; 2010***

ADRENAL GLANDı ETKILEYEN ENDOKRIN HASTALıKLAR

- Cushing; Kortizol artırır ⇨ Glikojenoliz ve glikoneogenez ile glukoz üretimini artırır.

- Aldesteronizm: K düşer, insülin potasyum pompası bozulur.

- Feokromastoma: Adrenalin, noradrenalin artması ile ilgili

- ***Tintinalli's Emergency Medicine: A Comprehensive Study Guide, 7e,Judith E. Tintinalli, J. Stephan Stapczynski, O. John Ma, David M. Cline, Rita K. Cydulka, Garth D. Meckler, The American College of Emergency Physicians; Section17; Endokrinology;2010***

TANI VE TETKİK

- Klinik Şüphe
- Kan glukoz düzeyi
- Kırmızı çizgimiz: 250 mg/dl

TANI-1

- Kan glukoz düzeyi
- İdrarda keton cisimleri
- Serum elektrolit değerleri
- Üre, kreatin
- Laktat değeri
- Kangazı
- Serum osmolaritesi
- Kardiak enzim paneli

TANI-2

- DİC paneli
- B-HCG
- Kan aspirin ve asetaminofen düzeyleri
- KC fonksiyon testleri
- Tiroit fonksiyon testleri
- Kan amilaz, lipaz düzeyi
- BOS incelemesi
- Gayta incelemesi

TANI-3

- Anatomik yapıların incelenmesi
- *Kranial CT*
- *Toraks CT*
- *Abdomen CT*
- *Pelvik CT*

TEDAVİ

Diabetes Care. 2009 Jul;32(7):1335-43. doi: 10.2337/dc09-9032.

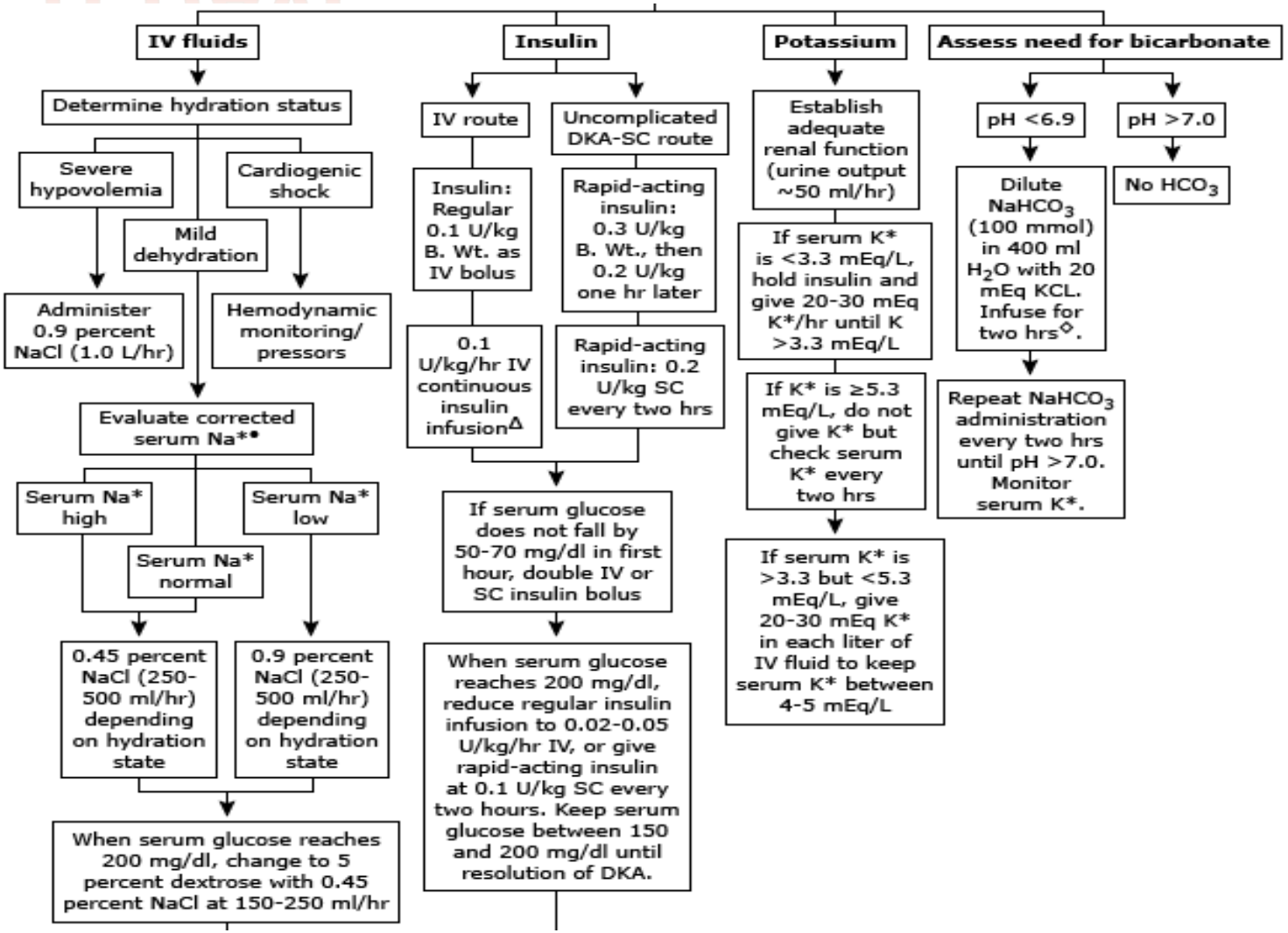
Hyperglycemic crises in adult patients with diabetes.

Kitabchi AE[1], Umpierrez GE, Miles JM, Fisher JN.

- Acil servislerde DKA, HHD ve MİX Tipin tedavisi benzerdir.
- Dehidratasyonun düzeltilmesi
- Hipergliseminin düzeltilmesi
- Elektrolit imbalansının düzeltilmesi
- Komorbid olayların tanınması

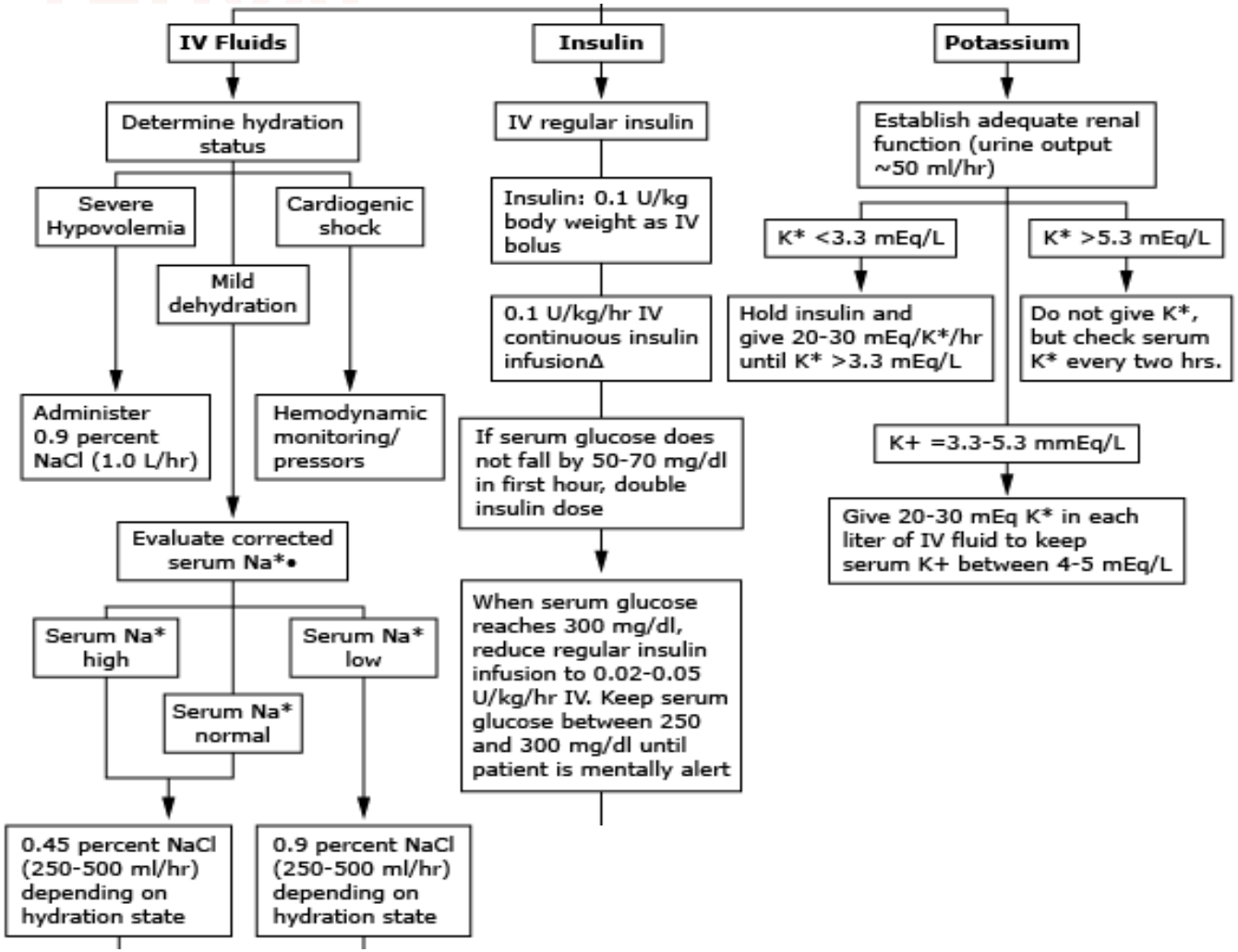
2014 Up ToDATE

DKA TEDAVİ



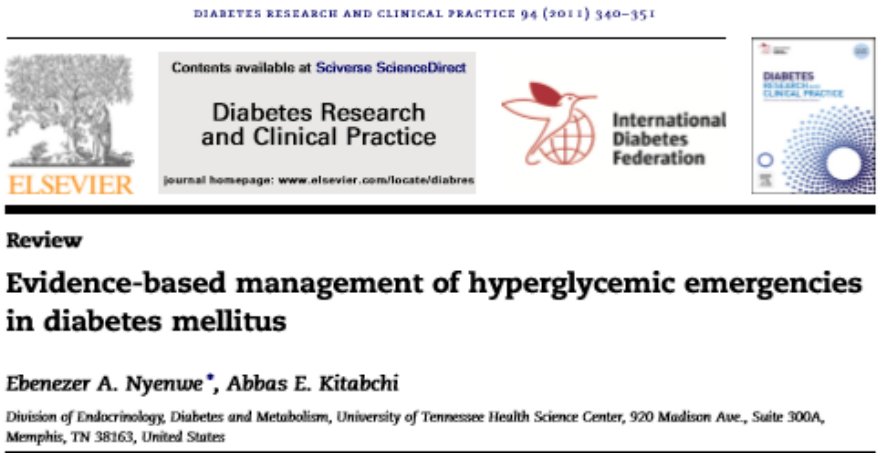
2014 Up ToDATE

HHS TEDAVİ



TABURCU ETME KRİTERLERİ

- **DKA**
- Kan glukozu < 200 mg/dl
- HCO3 > 15 mE/L
- PH > 7.3
- Anyon gap normal
- **HHD**
- Normal osmolarite
- Normal mental durum


DIABETES RESEARCH AND CLINICAL PRACTICE 94 (2011) 340–351

Contents available at SciVerse ScienceDirect

Diabetes Research and Clinical Practice

journal homepage: www.elsevier.com/locate/diabres

ELSEVIER

International Diabetes Federation

Review

Evidence-based management of hyperglycemic emergencies in diabetes mellitus

Ebenezer A. Nyenwe, Abbas E. Kitabchi*

Division of Endocrinology, Diabetes and Metabolism, University of Tennessee Health Science Center, 920 Madison Ave., Suite 300A, Memphis, TN 38163, United States

EUGLİSEMİK DİABETİK KETOASİDOZ

- 1973 Munro ve ark.
- DKA %10
- Kan şekeri < 250 mg/dl

The Journal of Emergency Medicine, Vol. 45, No. 5, pp. 797–805, 2013

0736-4679/$ - see front matter

http://dx.doi.org/10.1016/j.jemermed.2013.03.040

HYPERGLYCEMIC CRISIS

Ronald Van Ness-Otunnu, MD, MS* and Jason B. Hack, MD, FACEP†

Br Med J. 1973 Jun 9;2(5866):578-80.

Euglycaemic diabetic ketoacidosis.

Munro JF, Campbell IW, McCuish AC, Duncan LJ.

TEDAVİ

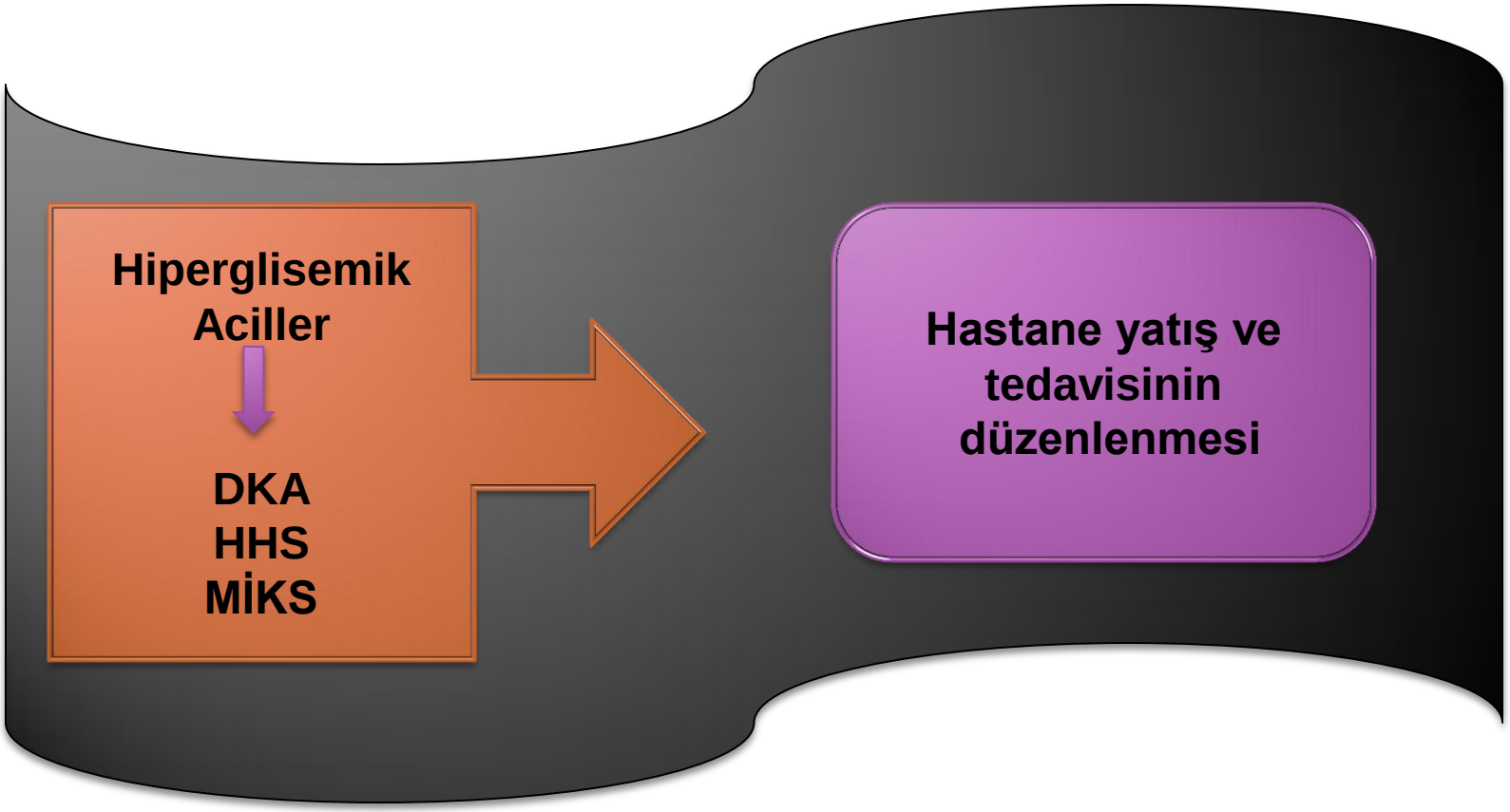
Acta Diabetol. 1993;30(4):251-3.

Euglycaemic diabetic ketoacidosis: does it exist?

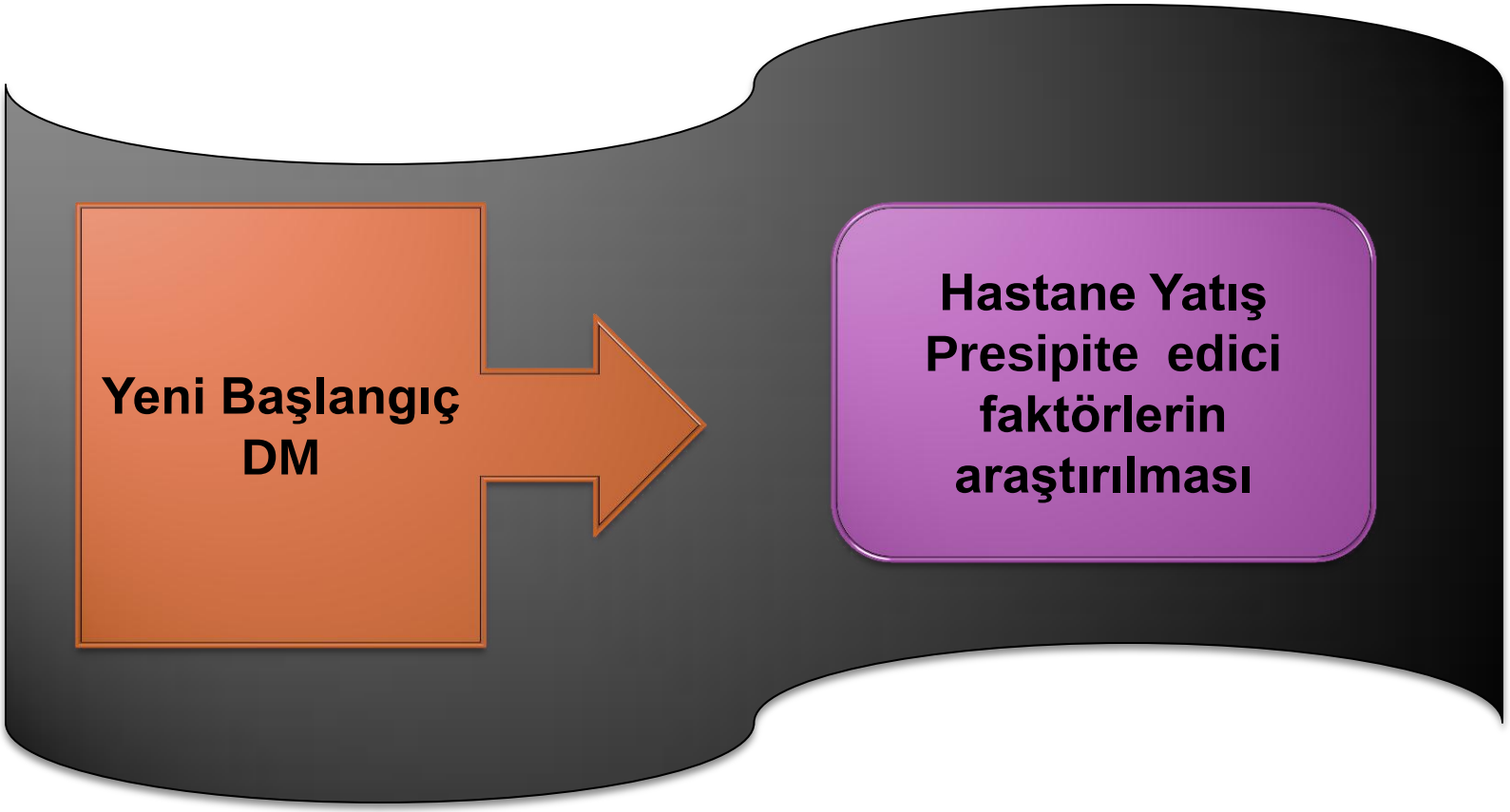
Jenkins D[1], Close CF, Krentz AJ, Nattrass M, Wright AD.

- Management of euglycaemic ketoacidosis with low-dose continuous intravenous infusion of insulin together with adequate fluid replacement was effective.

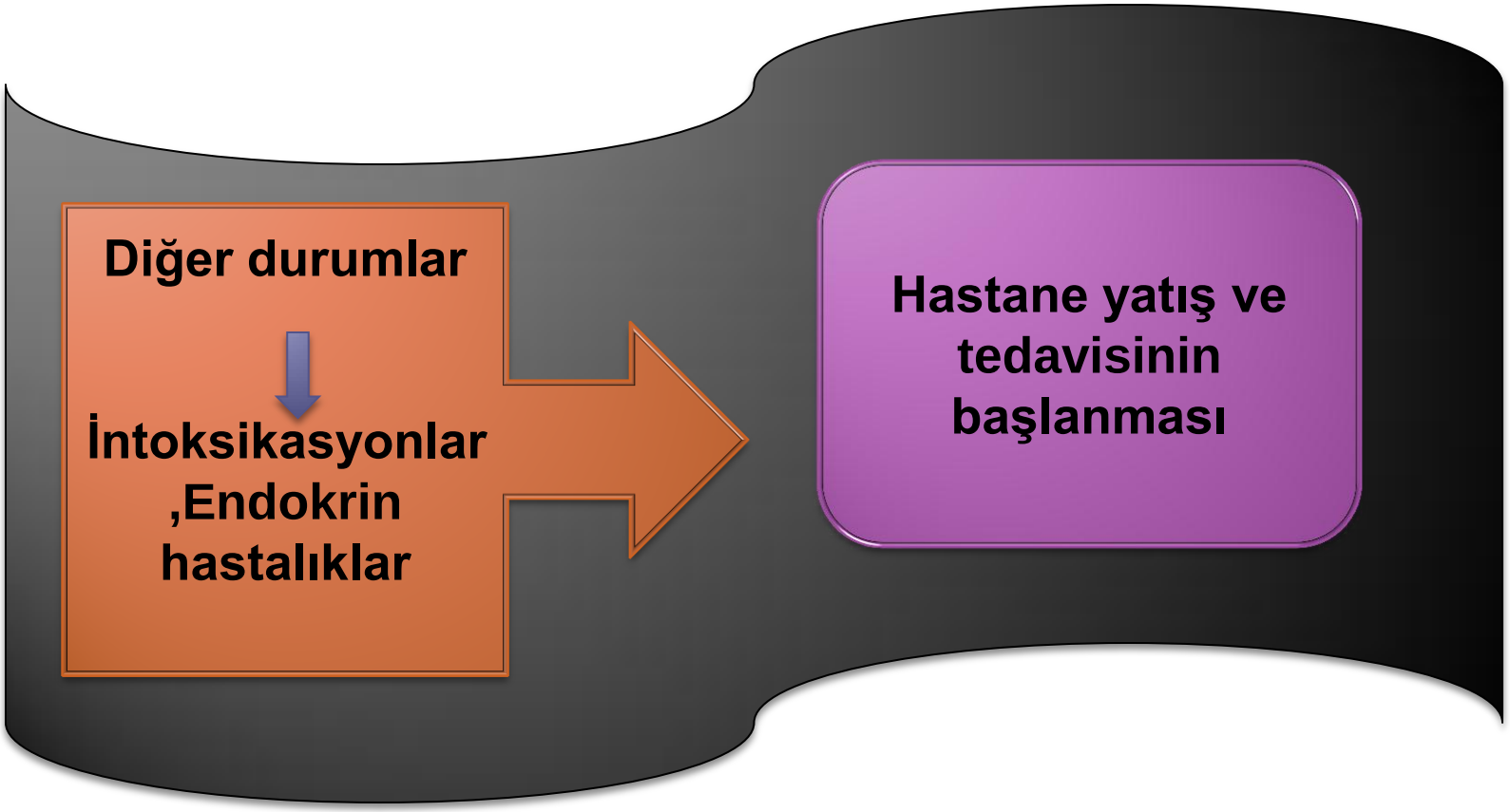
ÖZET-1


Hiperglisemik Aciller
DKA
HHS
MİKS
Hastane yatış ve tedavisinin düzenlenmesi

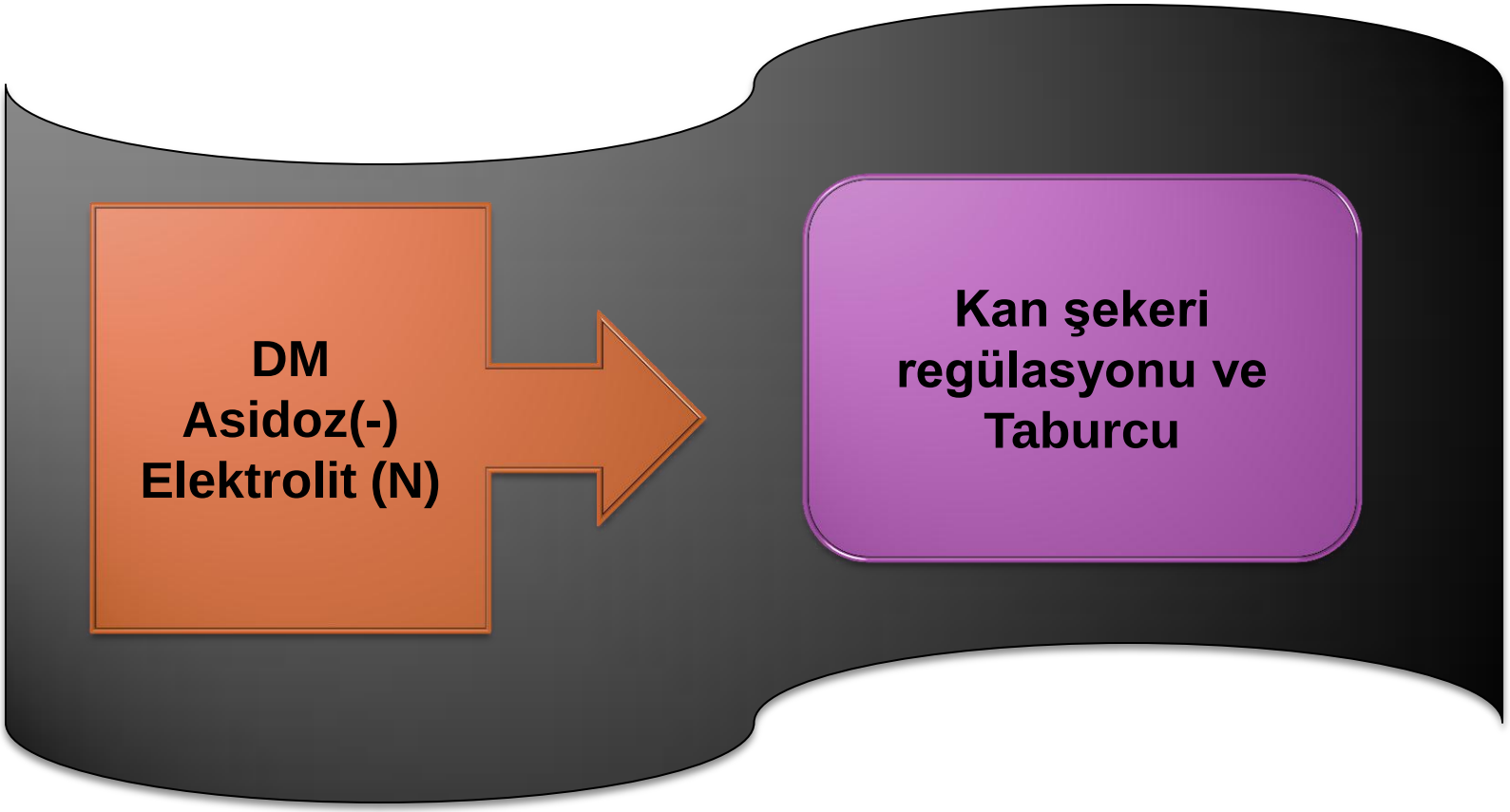
ÖZET-2


Yeni Başlangıç DM
Hastane Yatış
Presipite edici faktörlerin araştırılması

ÖZET-3


Diğer durumlar
İntoksikasyonlar ,Endokrin hastalıklar
Hastane yatış ve tedavisinin başlanması

ÖZET-4



KAYNAKLAR

- 1- Up To Date 2014
- 2-Tintinalli's Emergency Medicine: A Comprehensive Study Guide, 7e,Judith E. Tintinalli, J. Stephan Stapczynski, O. John Ma, David M. Cline, Rita K. Cydulka, Garth D. Meckler, The American College of Emergency Physicians; Section15; Toxicology
- 3- Van Ness-Otunnu R, Hack JB. Hyperglycemic crisis. J Emerg Med. 2013 Nov;45(5):797-805. doi: 10.1016/j.jemermed.2013.
- 4-Hyperglycemic crises in adult patients with diabetes. Kitabchi AE, Umpierrez GE, Miles JM, Fisher JN. Diabetes Care. 2009 Jul;32(7):1335-43. doi: 10.2337/dc09-9032.
- 5-Huang CC1, Kuo SC, Chien TW, Lin HJ, Guo HR, Chen WL, Chen JH, Chang SH, Su SB. Predicting the hyperglycemic crisis death (PHD) score: a new decision rule for emergency and critical care. Am J Emerg Med. 2013 May;31(5):830-4. doi: 10.1016/j.ajem.2013.
- 6-Chaithongdi N1, Subauste JS, Koch CA, Geraci SA. Diagnosis and management of hyperglycemic emergencies. Hormones (Athens). 2011; 10(4):250-60.
- 7-Nyenwe EA1, Kitabchi AE. Evidence-based management of hyperglycemic emergencies in diabetes mellitus. Diabetes Res Clin Pract. 2011;94(3):340-51. doi: 10.1016/j.


Teşekkür
Ederim