

# Role of capsule endoscopy in the diagnosis and management of Crohn's disease



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## **Role of capsule endoscopy in CD- open questions:**

- **Is CE more sensitive than conventional imaging in suspected small bowel CD?**
- **Is detection of such findings clinically meaningful? i.e. does it change management ?**
- **Is CE safe in patients with known/suspected CD?**
- **Is there a role for CE in known CD ?  
to monitor drug effects? Severity of obstruction?  
assess prognosis? etc.**

- **Is capsule endoscopy more sensitive than conventional imaging modalities for detection of small bowel Crohn's disease?**

# Diagnostic Yield of CE in patients with Suspected CD (119 pt.):

Study	Pts.	Indication	Diagnostic yield	Comparative studies with yield
<b>Fireman et al.</b> Gut 2003	17	Suspected CD	71%	Colonoscopy 0%, EGD 0%, SBFT 0%
<b>Liangpunsakul et al.</b> Am J Gastroenterol 2003	3	Abdom.pain, anemia	100%	Enteroclysis 0%
<b>Herrerias et al.</b> Endoscopy 2003	21	Suspected CD	43%	Colonoscopy 5%, EGD 0%, SBFT 0%
<b>Eliakim et al.</b> Dig Liver Dis 2004	35	Suspected CD	77%	CTE or SBFT 26%
<b>Reddy et al.</b> Digest Endosc 2004	11	Suspected or known CD	100%	Colonoscopy 0%, SBFT 0%
<b>Ge et al.</b> World J Gastroenterol 2004	20	Suspected CD	65%	Colonoscopy 0%, EGD 0%, SBFT 0%
<b>Argüelles-Arias et al.</b> Endoscopy 2004	12	Pediatrics Suspected CD	58%	Colonoscopy 0%, EGD 0%, SBFT 0%

# **SUBJECTS AND METHODS:**

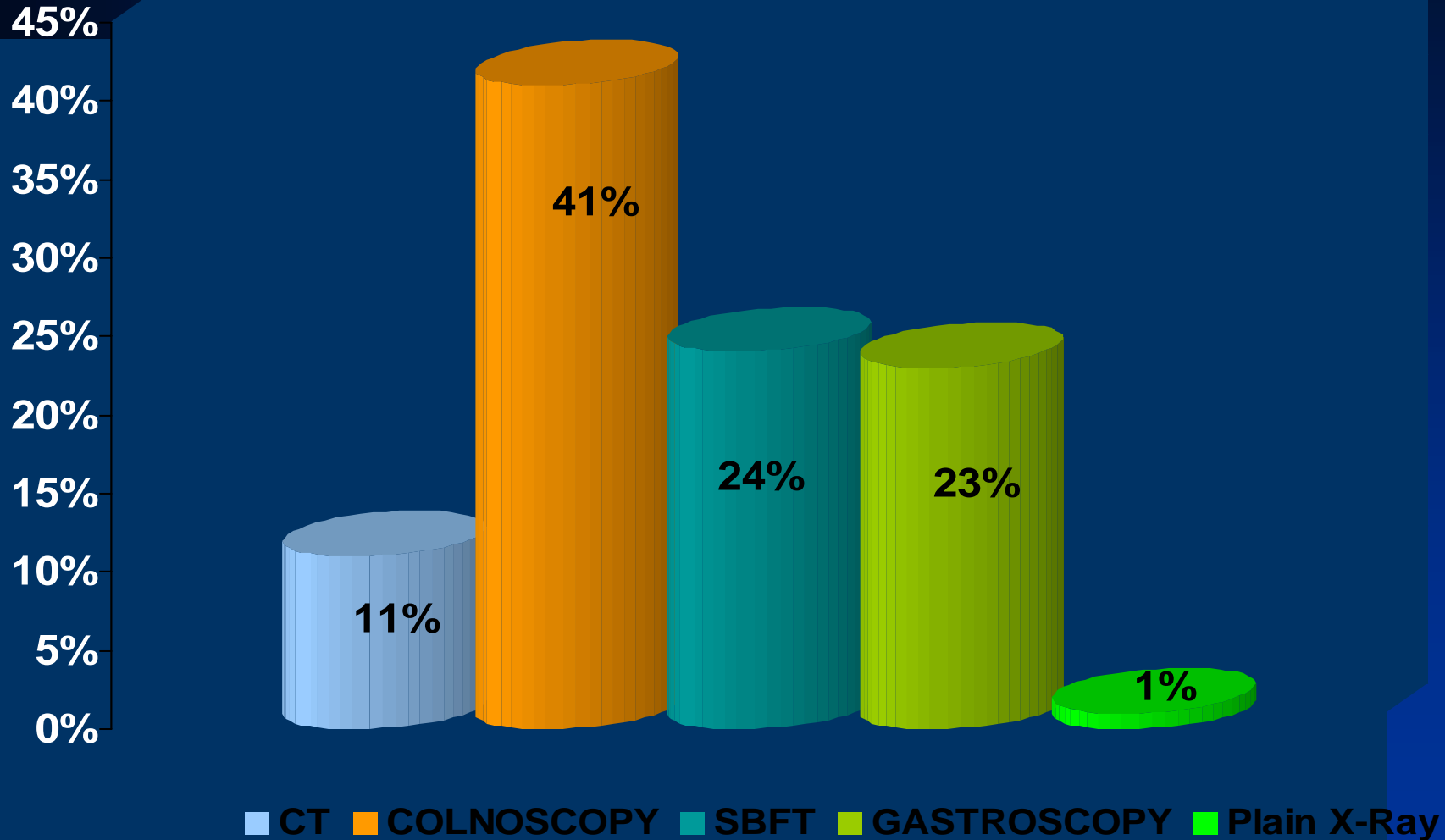
## **Eliakim et.al**

- \* Thirty five patients with either recurrent abdominal pain, weight loss or chronic diarrhea were investigated.**
- \* All underwent barium follow-through followed by capsule endoscopy and entero-CT.**
- \* Radiologist was blinded to capsule results**
- \* In cases with discrepancy between results, colonoscopy with ileoscopy was performed**
- \* Diagnosis, extent of disease was recorded in all patients**

# RESULTS:

- ◆ **35 PATIENTS (22 MALES, 13 FEMALES)**
- ◆ **Mean age  $28.4 \pm 12.2$  years (range 20 to 57)**
- ◆ **85% had abdominal pain, 83% diarrhea and 69% had weight loss**
- ◆ **Mean duration of symptoms 8 months**
- ◆ **Mean hemoglobin was 13.1 g% (10-15 g%)**
- ◆ **20 patients underwent entero CT.**

# PREVIOUS PROCEDURES:



# Crohn's disease on CE:

2:50:00  
Gk

19 Jun 02



GIVEN(R)

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MKR

Nov 06 00



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4:12:40  
DBJ

17 Oct 01



GIVEN(R)

5:19:35  
DBJ

17 Oct 01



GIVEN(R)

# SMALL ULCER- JEJENUM

1:11:58

01 Aug 01

yun



GIVEN(R)

6:23:19

22 Aug 01

ysh



GIVEN(R)

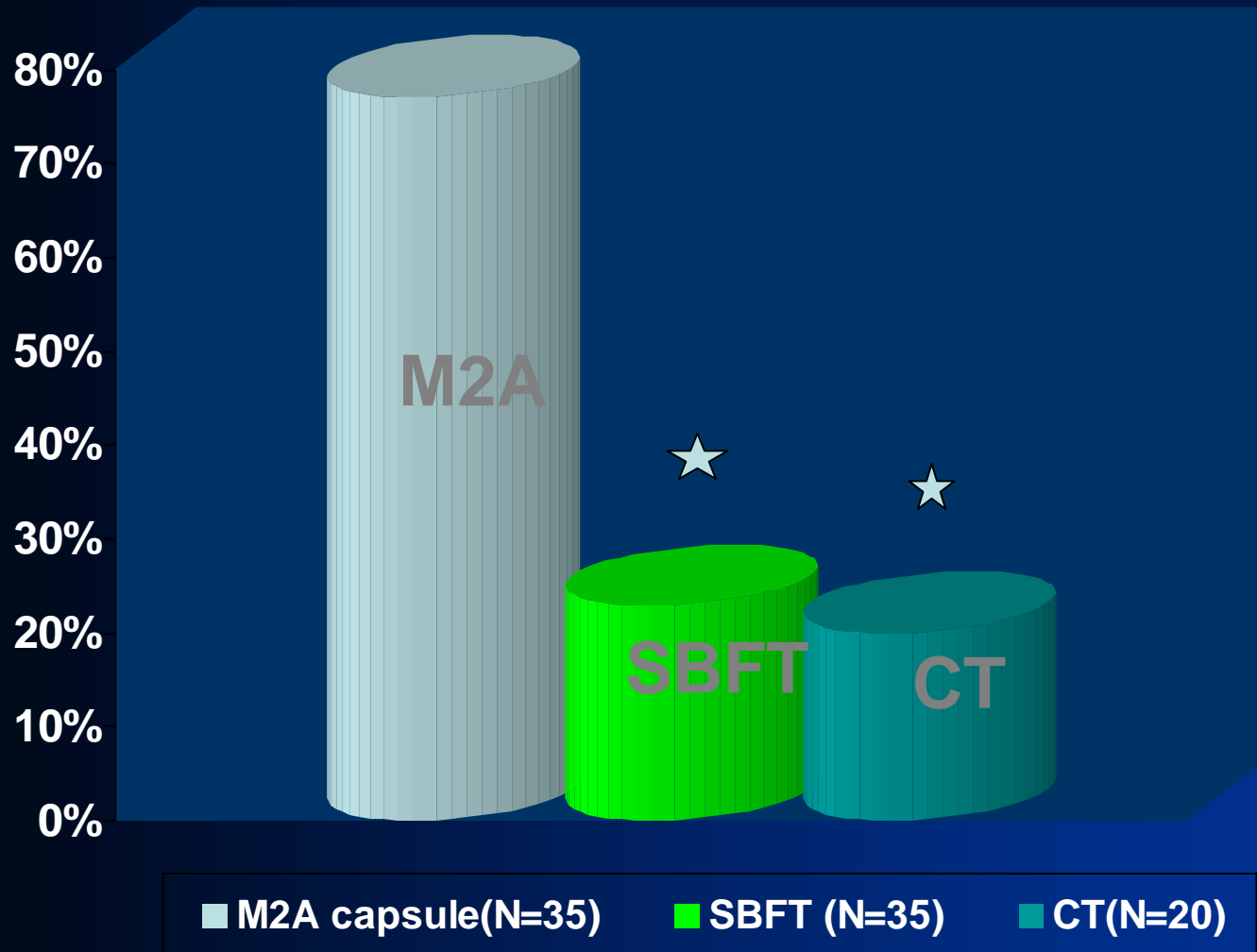
**NODULAR LYMPHOID HYPERPLASIA**

# CAPSULE PROCEDURE:

- **CONFIRMED DIAGNOSIS - 9 PT.**
- **EXTENDED INVOLVMENT - 6PT.**
- **MADE NEW DIAGNOSIS - 8PT.\***
- **RULED OUT DIAGNOSIS - 10PT.\***
- **NEW DIAGNOSIS - 7PT.\***

**confirmed by ileoscopy\***

# DIAGNOSTIC YIELD:



## CE AND CD IN PATIENTS WITH OCCULT GI BLEEDING

- 8 studies in peer- reviewed journals.
- 6-9% of patients with occult GI bleeding will be diagnosed to have CD by CE.
- CE diagnosed more patients with CD than SBFT.

Eliakim & Adler. *Gastrointest.Endosc.Clin. N. Amer.* 2004;14:129-137.

# **But... There are still problems:**

- **Lesions discovered at CE are consistent with but not diagnostic of Crohn's.**
- **Prevalence of small bowel erosions in normal healthy volunteers unknown?**
- **Some of these lesions but not all, can be identified and biopsied by ileoscopy.**

# Causes of Small Bowel Ulceration:

- **Crohn's disease** →
- **Drugs (NSAIDs)** →
- **Mesenteric arterial insufficiency** →
- **Other**  
(Infections, Toxins, Vasculitis, ulcerative jejuno-ileitis, Lymphoma, Carcinoma, Radiation, Behçet's)

2:49:37  
CA 02 May 02



GIVEN(R)

6:41:17  
CM 25 Oct 01



GIVEN(R)

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RB 08 Aug 02



GIVEN(R)

- **Does the detection of such findings with CE clinically change patient management??**

# Change in management after diagnosis in patients with suspected CD (93 pt.):

Study	Pts	Indication	Yield	Result of therapy
<b>Eliakim et al.</b> Eur J G. Hepatol 2003	20	Suspected CD	12 (60%)	<b>12/12 improved</b>
<b>Fireman et al.</b> Gut 2003	17	Suspected CD	12 (71%)	<b>10/12 improved</b>
<b>Liangpunsakul et al.</b> Am J Gastroenterol 2003	3	Abdom. pain, anemia	3 (100%)	<b>3/3 improved</b>
<b>Herrerias et al.</b> Endoscopy 2003	21	Suspected CD	9 (43%)	<b>9/9 improved</b>
<b>Ge et al.</b> World J Gastroenterol 2004	20	Suspected CD	13 (65%)	<b>11/13 improved</b>
<b>Argüelles-Arias et al.</b> Endoscopy 2004	12	Pediatrics Suspected CD	7 (58%)	<b>7/7 improved</b>

## **But.... There are still problems:**

- **Clinical response to empirical treatment is not definitive proof of CD.**
- **It's implied, but not proved, that early treatment of these presumed early CD lesions alters the nature of the disease.**
- **The follow-up in all of these studies is limited.**

What about known CD:

# INITIAL EXPERIENCE WITH CE IN THE DIAGNOSIS AND MANAGEMENT OF IBD.

Mow et al. Clin Gastroenterol Hepatol 2004

50 patients evaluated at a tertiary referral center:

1. evaluation for SB involvement in pts. with isolated colitis (n=22).
2. determination of extent of SB disease in pts. with known CD (n=20).
3. Part of work-up of suspected IBD (n=8)

CAPSULE FINDINGS	N	Clinical improvement with directed medical therapy based on CE findings (%)
<b>Diagnostic</b> (≥ 3 ulcerations)	20	17 (85)
<b>Suspicious</b> (≤ 3 ulcerations)	10	7 (70)
<b>Negative</b>	20	-

- In 5 pts. thought to have UC (considered for colectomy) the diagnosis was changed to CD and medical treatment was modified

# CE IN IBD: FINDINGS AND EFFECTS ON CLINICAL OUTCOMES

Legnani et al. DDW 2004

- A.** abnormal SBFT, r/o CD (n=9)
- B.** abdominal pain, normal studies, r/o CD (n=23)
- C.** known UC or Crohn's colitis: normal SBFT and persistent symptoms, r/o small bowel disease (n=20)
- D.** known CD, persistent obscure bleeding (n=13)

Group	N	Positive Findings	Therapeutic Benefit
<b>A</b>	9	1	1
<b>B</b>	23	1	1
<b>C</b>	20	9	8
<b>D</b>	13	10	10
<b>Total</b>	65	21	20

**Groups A and B:** No S.B. Crohn's findings in 30/32; No evidence of CD during a mean f-up of 19m.

**NPV = 100%**

**Overall:** Therapeutic decisions based on CE **improved clinical outcomes in 20/21 (95%)** patients with confirmed CD.

**Diagnosis of small bowel CD: A Prospective Comparison of CE,  
Radiology and standard Endoscopy.**

**Voderholzer et al. DDW 2004**

**48 consecutive patients  
with known (n=45) or suspected CD (n=3)**

**Therapeutic impact of CE in CD:**

**Overall: 24%**

**Patients with known CD: 17%**

**Patients with suspected CD: 100%**

# CE IN PATIENTS WITH INDETERMINED COLITIS:

- CE CHANGED DIAGNOSIS IN 7/14 PATIENTS WITH INDETERMINED COLITIS (2 studies).
- BETTER THAN SBFT/ENTERO-CT IN DEFINING ACTIVITY AND EXTENT (81%).

Eliakim & Adler. *Gastrointest.Endosc.Clin. N. Amer.* 2004;14:129-137.

# Meta-analysis of CE compared to other modalities in patients with non-stricturing SB CD:

- 10 studies comparing CE to SB radiology:
- Diagnostic yield of CE was 62% versus 27% of SBFT.
  - Diagnostic yield of CE was 73% versus 41% of CT.
  - Diagnostic yield of CE versus ileoscopy was 57% vs. 43% (4 studies).

Triester SL et al. ACG 2004

# CE versus SBFT for the diagnosis of SB recurrence of CD

Buchman AL et. al. AM J Gastroenterol 2004;99:2172-2177

30 pt. With known CD and suspected SB recurrence

Grading scales for SBFT and CE from 0-3

## Results:

Recurrent CD was diagnosed by CE in 21/30 and by SBFT  
in 20/30 patients.

CE found mucosal disease in 6 pt. with normal SBFT.

SBFT found mucosal disease in 5 pt. with normal CE.

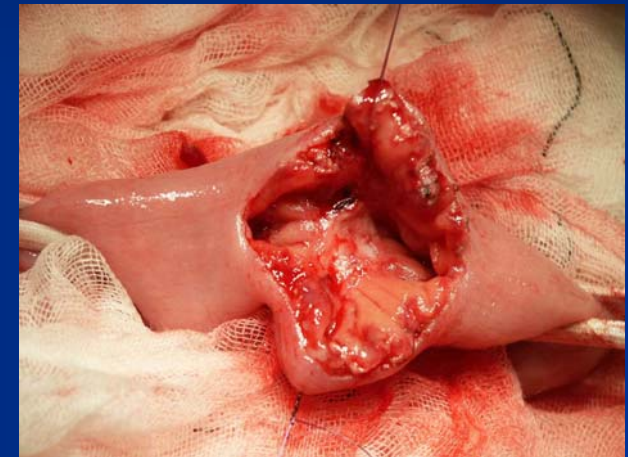
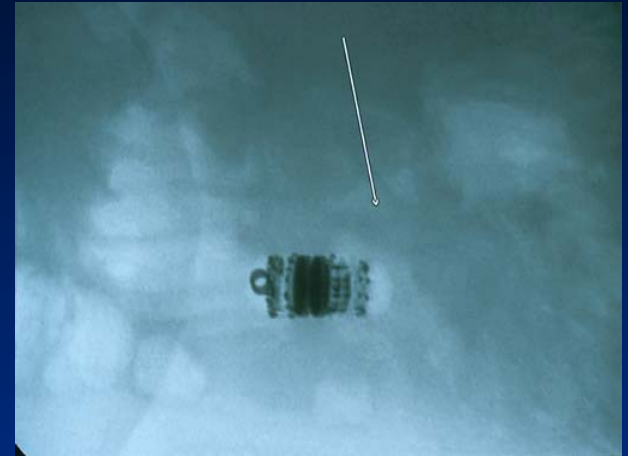
## Conclusions:

SBFT and CE are complementary for detection of SB  
recurrence.

- **Is CE safe in patients with known CD or suspected CD?**

# Complications rate:

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## **Complications rate:**

**7/937 (0.75%)** of patients ingesting CE  
(any study) required intervention for  
capsule removal

**Barkin J et al.**

**Am J Gastroenterol 2002**

# CE retention in patients with suspected or Known\* CD:

Study	Capsule retention/ Patients
<b>Fireman et al.</b> Gut 2003	0/17
<b>Herrerias et al.</b> Endoscopy 2003	0/21
<b>Liangpunsakul et al.</b> Am J Gastro 2003	0/3
<b>Ge et al.</b> World J Gastro 2004	3/20*
<b>Reddy et al.</b> Digest Endosc 2004	2/11*
<b>Mow et al.</b> Clin Gastro Hepatol 2004	2/50*
<b>Buchman et al.</b> Am J Gastro 2004	2/30*
<b>Eliakim et al.</b> Dig Liver Dis 2004	0/35
<b>Argüelles-Arias et al.</b> Endoscopy 2004	0/12
<b>Total</b>	<b>9/199 (4.5%)</b>

\* Series including pts. with known CD

# CE retention in CD (summary):

- Altogether 199 patients with known or suspected CD ingested CE.
- Capsule retention occurred in 0/88 (0%) of pt. with **suspected CD**.
- Capsule retention occurred in 9/111 (8%) of patients with **known CD**.
- None had signs of intestinal obstruction.
- Patency capsule may resolve this problem.

- **In patients with known CD- is there a role for CE to:  
monitor mucosal healing in  
response to therapy?**

**As a tool for altering/targeting  
treatment?**

**To identify patient subgroups?**

**To assess prognosis? Severity?**

Well.....we don't know the  
answer to most of these questions  
Yet!!!!

# **CE in patients with known CD- Postulations:**

- **CE findings may potentially alter management:**  
*e.g. early switch to immunosuppressive therapy.*
- **Patients with suspected relapse may not have active disease and potentially harmful empiric therapy may be avoided.**
- **No data on effect of drugs on mucosal healing, evaluated by CE.**
- **No data on effect of CE on prognosis.**
- **Higher rate of retention than in suspected CD.**
- **Effect on clinical benefit still unclear.**

# Study Scheme:

**Remission**  
GC induced  
now GC free  
> 3 weeks  
< 6 months



**Maintenance**

Standard  
Azathioprine/6-MP!  
No Infliximab

**Relapse**  
CDAI increase  $\geq 70$   
to  $\geq 150$  points  
for at least 2 weeks  
GC or other acute tx

Capsule

Capsule

Capsule

Week 0

12 months (60%)

24 months (40%)



24 Month

# Possible answers from this study:

- Effect of steroids on small bowel mucosal healing.
- The ability of CE to assess prognosis.
- The ability of CE to assess severity of CD.
- The ability of CE to divide patients to specific subgroups.

# **Cost-Effectiveness of CE:**

- **In the diagnosis of CD:**

**“ A diagnostic algorithm employing CE after SBFT would most likely be less costly, from a payer perspective, than SBFT followed by enteroclysis “**

**Goldfarb et al. DDW 2004**

# Take home messages:

- ✓ CE is efficient and safe in suspected CD.
- ✓ Early use of CE in suspected CD may lead to earlier diagnosis which may influence the course of disease and result in improved quality of life.
- ✓ When used appropriately CE may prove to be cost-effective.
- ✓ The use of CE in medically treated known CD patients needs further evaluation !!

3:44:24

03 Sep 02

YFS



GIVEN(R)

**THANK YOU  
FOR  
YOUR  
ATTENTION!!!!**