



RETROGRADE vs. ANTEGRADE FEMORAL NAILING

ISSUES

ANTEGRADE vs. RETROGRADE

PIRIFORMIS vs. TROCHANTER

FLAT vs. FRACTURE TABLE

RETROGRADE vs. ANTEGRADE FEMORAL NAILING

SWIONTKOWSKI, 1984

FIRST DESCRIBED

RETROGRADE TECHNIQUE

USING MEDIAL EPICONDYLE

RETROGRADE vs. ANTEGRADE FEMORAL NAILING

RETROGRADE NAILING

- SANDERS (TAMPA 1992)
- PATTERSON (SEATTLE 1995)
- MOED & WATSON (MOTOWN 1995)
- HERSCOVICI (TAMPA 1996)

RETROGRADE vs. ANTEGRADE FEMORAL NAILING

INDICATIONS

- PREGNANCY
- IPSILATERAL NECK & SHAFT
- IPSILATERAL PELVIS ("TAB")
- FLEXING KNEE
- BILATERAL FEMORAL SHAFTS
- POLYTRAUMA / POLYFXS

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RETROGRADE vs. ANTEGRADE FEMORAL NAILING

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- PREGNANCY
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- **● BILATERAL FEMORAL SHAFTS**
- POLYTRAUMA / POLYFXS

RETROGRADE vs. ANTEGRADE FEMORAL NAILING

INDICATIONS

- PREGNANCY
- DISTAL FEMORAL NECK FRACTURE
- DISTAL FEMORAL PELVIS "TAP"
- FRACTURED KNEE
- BILATERAL FEMORAL FRACTURES
- **POLYTRAUMA / POLYFXS**

RETROGRADE vs. ANTEGRADE FEMORAL NAILING

SET UP

- **FLAT TABLE**
- **BUMP UNDER KNEE**
- **C-ARM**

RETROGRADE vs. ANTEGRADE FEMORAL NAILING

Too anterior =

- Flexion
- Posterior translation


Too posterior =

- Extension
- Anterior translation



RETROGRADE vs. ANTEGRADE FEMORAL NAILING

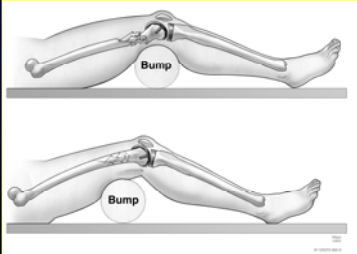
If the guide wire is perpendicular to joint surface, the articular segment will be in varus.



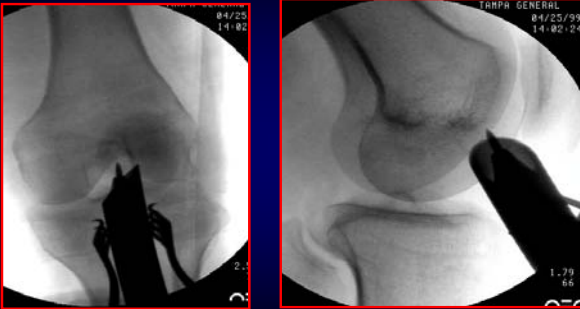
RETROGRADE vs. ANTEGRADE FEMORAL NAILING

DISTAL 1/3 FXS

- Bumps on Triangle
- Fracture Reduction Tool
- F-tool, Mallets
- Skeletal Traction
- Femoral Distractor
- Clamps
- Bone Hook
- Ball Spike
- Schanz pins
- Provisional Plate

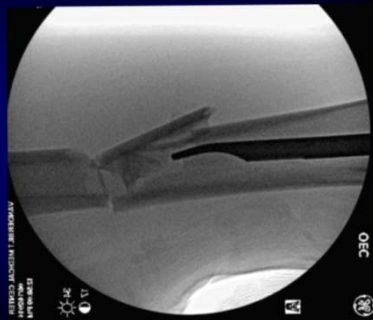


RETROGRADE vs. ANTEGRADE FEMORAL NAILING

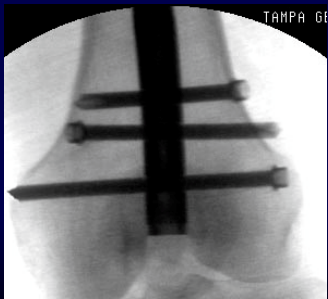


RETROGRADE vs. ANTEGRADE FEMORAL NAILING

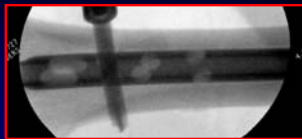
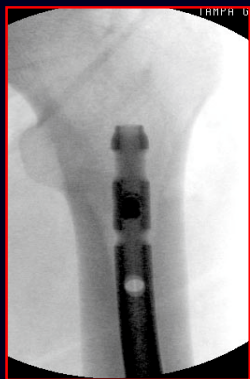
- Bumps on Triangle
- Fracture Reduction Tool
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RETROGRADE vs. ANTEGRADE FEMORAL NAILING



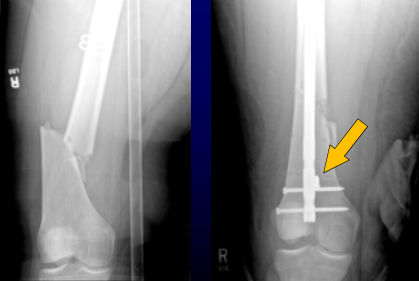
RETROGRADE vs. ANTEGRADE FEMORAL NAILING



RETROGRADE vs. ANTEGRADE FEMORAL NAILING

DISTAL 1/3 FXS

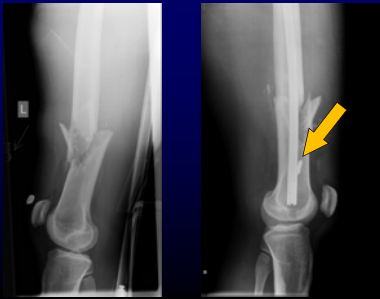
- **Blocking Screws**



RETROGRADE vs. ANTEGRADE FEMORAL NAILING

DISTAL 1/3 FXS

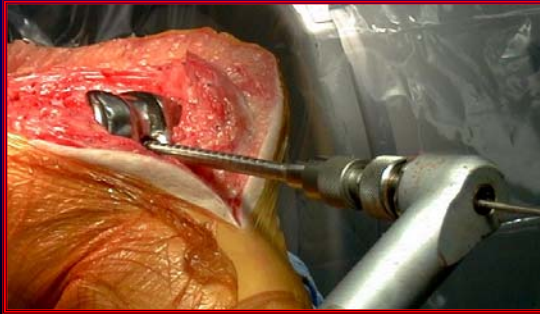
- **Blocking Screws**



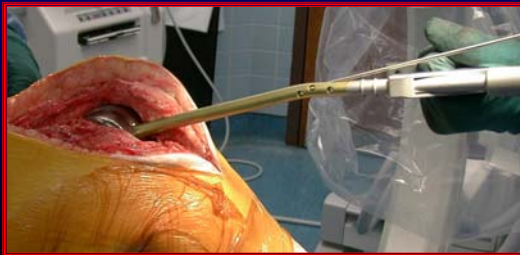
SIX (6) OPERATIONS POST TKA TO FIX STRESS FRACTURE. HAS NOT WALKED IN 5 YEARS



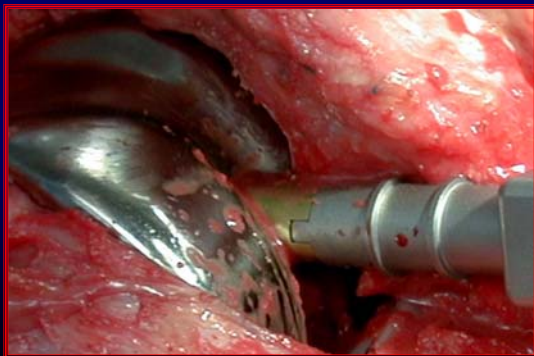
RETROGRADE vs. ANTEGRADE FEMORAL NAILING



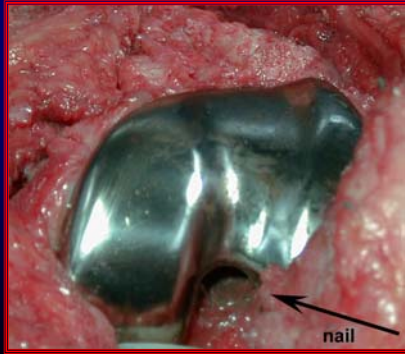
RETROGRADE vs. ANTEGRADE FEMORAL NAILING



RETROGRADE vs. ANTEGRADE FEMORAL NAILING



RETROGRADE vs. ANTEGRADE FEMORAL NAILING

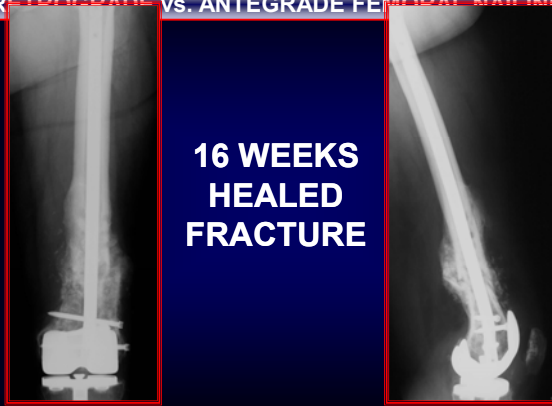


RETROGRADE vs. ANTEGRADE FEMORAL NAILING



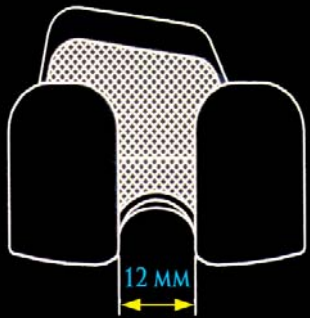
1 WEEK
POST- OP

RETROGRADE vs. ANTEGRADE FEMORAL NAILING



16 WEEKS
HEALED
FRACTURE

LIMITATIONS - IM NAILING

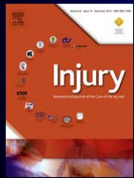


FLORIDA ORTHOPAEDIC INSTITUTE

Retrograde femoral nailing of periprosthetic fractures around total knee replacements

Mark D. Jones^{b,*}, Charlotte Carpenter^a, Stephen R. Mitchell^a, Michael Whitehouse^c, Sanchit Mehendale^a

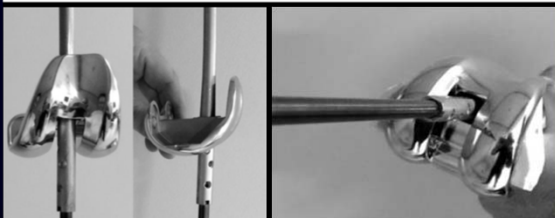
^aDepartment of Trauma and Orthopaedics, University Hospitals Bristol NHS Foundation Trust, Upper Maudlin Street, Bristol BS2 8HQ, UK
^bDepartment of Trauma and Orthopaedics, Tunbridge Wells Hospital, Maidstone and Tunbridge Wells NHS Trust, Tunbridge Road, Pembury TN2 4QJ, UK
^cMusculoskeletal Research Unit, Level 1 Learning and Research Building, Southmead Hospital, Westbury on Trym, Bristol BS10 5NB, UK



2016, Vol 47
pp. 460 - 464

RETROGRADE FEMORAL INTRAMEDULLARY NAILS USED.

	Manufacturer Model Diameter (mm)	
Biomet	Phoenix retrograde nail	10.5
DePuy	ACE retrograde femoral nail	10
Smith & Nephew	Trigen retrograde femoral nail	10
Stryker	T2 supracondylar femoral nail	10



RETROGRADE vs. ANTEGRADE FEMORAL NAILING

ANTEGRADE FEMORAL NAIL INSERTION

RETROGRADE vs. ANTEGRADE FEMORAL NAILING

G. KÜNTSCHER – 1940's

- OPEN SECTION NAIL
- LATERAL POSITION
- TROCHANTERIC PORTAL

RETROGRADE vs. ANTEGRADE FEMORAL NAILING

CLOSED IM NAILING OF FEMORAL FRACTURES

520 FXS – 99.1% UNION

Winqvist et al.
JBJS 66A, 1984

RETROGRADE vs. ANTEGRADE FEMORAL NAILING

- OPEN SECTION
- STRAIGHT - 316L S.S.
- NON LOCKED
- LATERAL - FX TABLE
- LATERAL START

RETROGRADE vs. ANTEGRADE FEMORAL NAILING

**PROBLEM WITH
LARGER NAILS**

**PROXIMAL FEMUR
WOULD EXPLODE**

RETROGRADE vs. ANTEGRADE FEMORAL NAILING

RESULT ?




**PIRIFORMIS
FOSSA**

RETROGRADE vs. ANTEGRADE FEMORAL NAILING

PROBLEMS WITH ENTRY

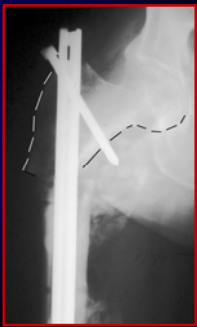
- DIFFICULT ENTRY
- VARUS NAILING



RETROGRADE vs. ANTEGRADE FEMORAL NAILING

PROBLEMS WITH ENTRY

- DIFFICULT ENTRY
- VARUS NAILING



RETROGRADE vs. ANTEGRADE FEMORAL NAILING

OBESE PATIENTS

FORGET ABOUT IT!



RETROGRADE vs. ANTEGRADE FEMORAL NAILING

PIRIFORMIS PORTAL IN OBESE PTS

● **McKEE & WADELL**

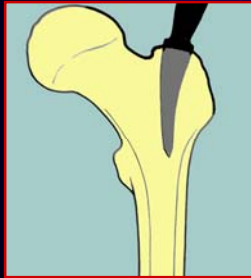
J. Trauma 1994

● **OSTRUM**

Orthopedics 1996

RETROGRADE vs. ANTEGRADE FEMORAL NAILING

TROCHANTERIC PORTAL REVISITED



**TIP OF
TROCH
AS ENTRY
PORTAL**

RETROGRADE vs. ANTEGRADE FEMORAL NAILING

TROCHANTERIC PORTAL REVISITED

**4° VALGUS
BEND IN
PROXIMAL
NAIL**



13 mms
PROXIMAL
DIAMETER

TROCHANTERIC
ANTEGRADE
NAIL (T.A.N.)

RETROGRADE vs. ANTEGRADE FEMORAL NAILING

MATERIALS

- 32 FEMUR SHAFT FXS
- AVE. AGE 45 (14 – 97)
- 14 OBESE (3 > 400 LBS)

RETROGRADE vs. ANTEGRADE FEMORAL NAILING

MATERIALS

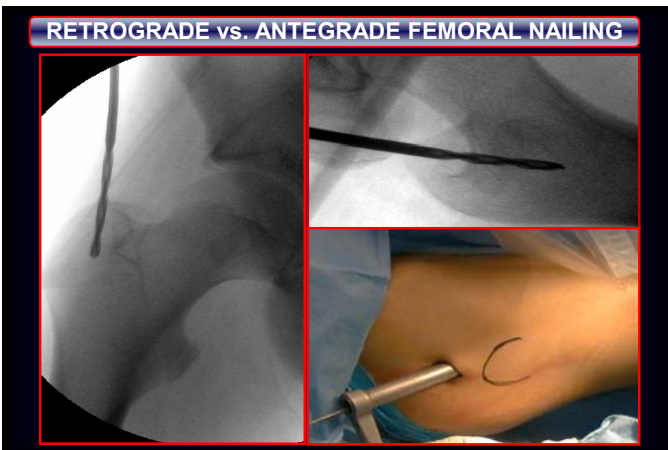
- SUPINE (WELL LEG UP)
- OSI FX TABLE
- T.A.N. NAIL (ALL CASES)
- TIP OF TROCH (ALL CASES)

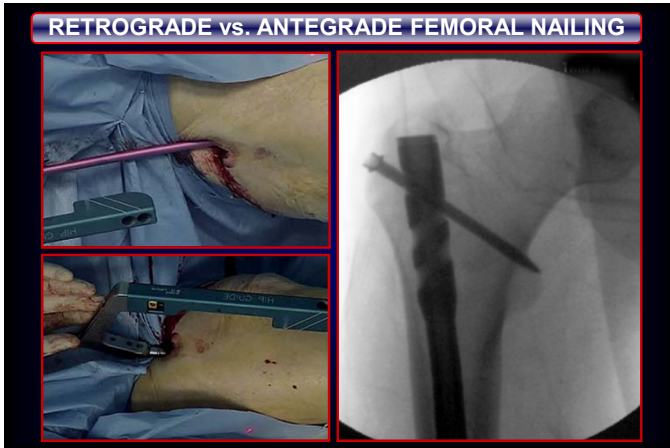
RETROGRADE vs. ANTEGRADE FEMORAL NAILING

OPERATIVE TECHNIQUE

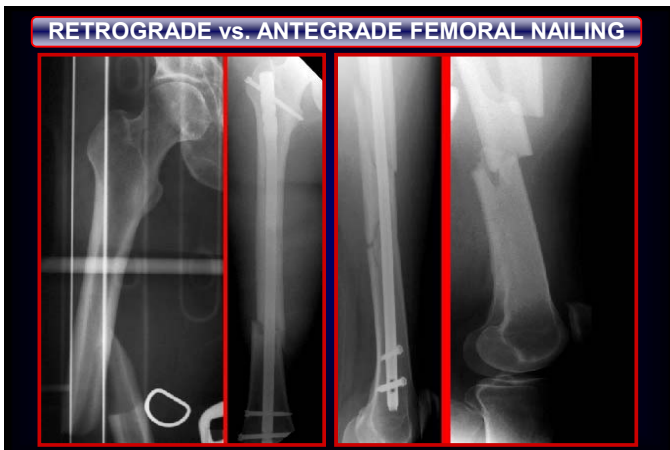













RETROGRADE vs. ANTEGRADE FEMORAL NAILING

RESULTS



RETROGRADE vs. ANTEGRADE FEMORAL NAILING

RESULTS

- 24/32 FXS (> 1 YR F/U)
- 100% UNION
- NO INFECTIONS
- 4 PTS – MILD PAIN
- HARRIS SCORE 77.6

RETROGRADE vs. ANTEGRADE FEMORAL NAILING

RESULTS

- NO COMPLICATIONS (PROX FEMUR)

RETROGRADE vs. ANTEGRADE FEMORAL NAILING

RESULTS

- NO COMPLICATIONS
- EASE OF INSERTION WAS REMARKABLE (EVEN IN THE OBESE PT)

RETROGRADE vs. ANTEGRADE FEMORAL NAILING

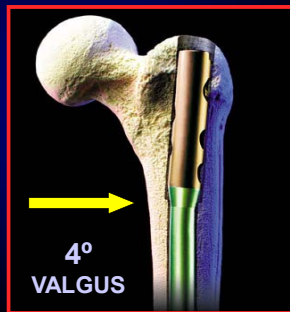
RESULTS

- NO COMPLICATIONS
- EASE OF INSERTION WAS REMARKABLE (EVEN IN THE OBESE PT)
- SURGEON SATISFACTION WAS EXCELLENT

RETROGRADE vs. ANTEGRADE FEMORAL NAILING


TECHNICAL ADVANCES

SMALL PROXIMAL DIAMETER NAIL (13 mm)



RETROGRADE vs. ANTEGRADE FEMORAL NAILING


**TIP OF THE TROCH
SUPINE ON FX TABLE**



**NO COMPLICATIONS
SEEN: EVEN IN
MORBIDLY OBESE PTS**

RETROGRADE vs. ANTEGRADE FEMORAL NAILING

**TIP OF THE TROCH
SUPINE ON FX TABLE**



**EASE & SPEED OF
INSERTION A DISTINCT
SURGICAL ADVANTAGE**

RETROGRADE vs. ANTEGRADE FEMORAL NAILING

Clamp-Assisted Reduction of High Subtrochanteric Fractures of the Femur

By Alan Afari, MD, Frank Liporace, MD, Eric Lindvall, DO, Anthony Infante Jr., DO, Henry C. Sagi, MD, and George J. Haidukevych, MD

J Bone Joint Surg Am. 2009;91:1913-8 • doi:10.2106/JBJS.H.01563

- **44 Patients**
 - Antegrade IMN with Clamp through Lateral Incision
 - 9 with Cerclage Wire
 - No Stripping!
 - 43/44 United
 - 86% Reductions Anatomic
 - All within 5 degrees

RETROGRADE vs. ANTEGRADE FEMORAL NAILING



RETROGRADE vs. ANTEGRADE FEMORAL NAILING



RETROGRADE vs. ANTEGRADE FEMORAL NAILING



RETROGRADE vs. ANTEGRADE FEMORAL NAILING

PROSPECTIVE, RANDOMIZED STUDIES APPEAR in 2000

- TORNETTA & TIBURZI
- OSTRUM & POKA

RETROGRADE = ANTEGRADE

RETROGRADE vs. ANTEGRADE FEMORAL NAILING

Retrograde Versus Antegrade Nailing of Femoral Shaft Fractures

William M. Ricci, *Carlo Bellabarba, †Bradley Evanoff, ‡Dolfi Herscovici, †Thomas DiPasquale, and ‡Roy Sanders

Department of Orthopaedic Surgery, Barnes-Jewish Hospital, Washington University, St. Louis, Missouri, U.S.A.; *Department of Orthopaedics, University of Washington, Seattle, Washington, U.S.A.; †Division of General Medical Sciences, Washington University School of Medicine, St. Louis, Missouri, U.S.A.; and ‡Florida Orthopaedic Institute, Tampa, Florida, U.S.A.

J. Ortho Trauma
Vol. 15, # 3, 2001

RETROGRADE vs. ANTEGRADE FEMORAL NAILING

RETROGRADE = ANTEGRADE UNION AND MALUNION RATES.

There were more complications related to the knee after retrograde nailing

RETROGRADE vs. ANTEGRADE FEMORAL NAILING

RETROGRADE NAILING
 JAN 1, 1993 - JULY 1, 1997

RETROGRADE GROUP

20%

KNEE PAIN / STIFFNESS

RETROGRADE vs. ANTEGRADE FEMORAL NAILING

RETROGRADE NAILING
 JAN 1, 1993 - JULY 1, 1997

CAUSE OF PAIN

- **STARTING POINT**
- **INJURY**
- **WEAK QUADS**

} **?**

RETROGRADE vs. ANTEGRADE FEMORAL NAILING

Angular Malalignment After Intramedullary Nailing of Femoral Shaft Fractures

William M. Ricci, *Carlo Bellabarba, †Robert Lewis, ‡Bradley Evanoff, §Dolfi Herscovici, §Thomas DiPasquale, and §Roy Sanders

Department of Orthopaedic Surgery, Washington University School of Medicine, St. Louis, Missouri, U.S.A.; *Department of Orthopaedics, University of Washington, Seattle, Washington, U.S.A.; †University of South Florida School of Medicine, Tampa, Florida, U.S.A.; ‡Division of General Medical Sciences, Washington University School of Medicine, St. Louis, Missouri, U.S.A.; and §Florida Orthopaedic Institute, Tampa, Florida, U.S.A.

**J. Ortho Trauma
 Vol. 15, # 2, 2001**

RETROGRADE vs. ANTEGRADE FEMORAL NAILING

RETROGRADE NAILING

JAN 1, 1991 - MARCH 31, 1998

FEMORAL NAILS
319

↙ ↘

ANTEGRADE 163 RETROGRADE 156

RETROGRADE vs. ANTEGRADE FEMORAL NAILING

RETROGRADE NAILING

JAN 1, 1991 - MARCH 31, 1998

STARTING POINT
WAS
SURGEON'S
CHOICE

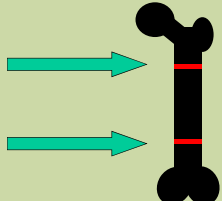
RETROGRADE vs. ANTEGRADE FEMORAL NAILING

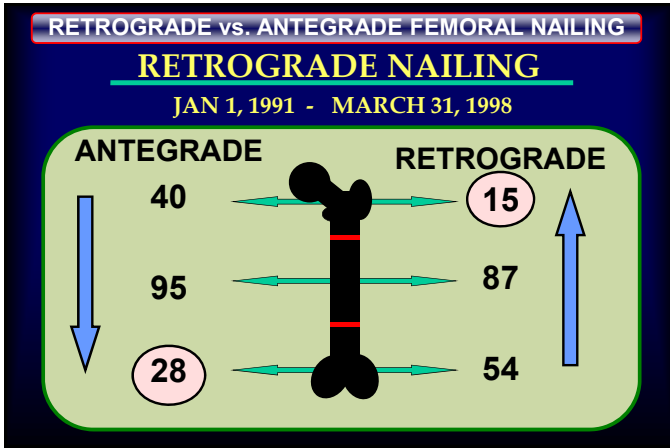
RETROGRADE NAILING

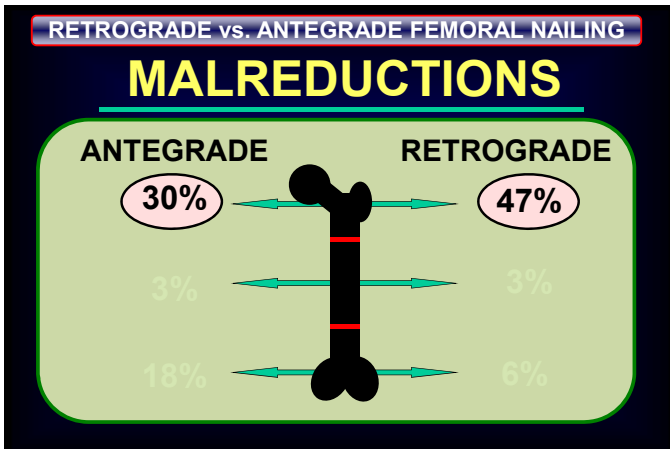
JAN 1, 1991 - MARCH 31, 1998

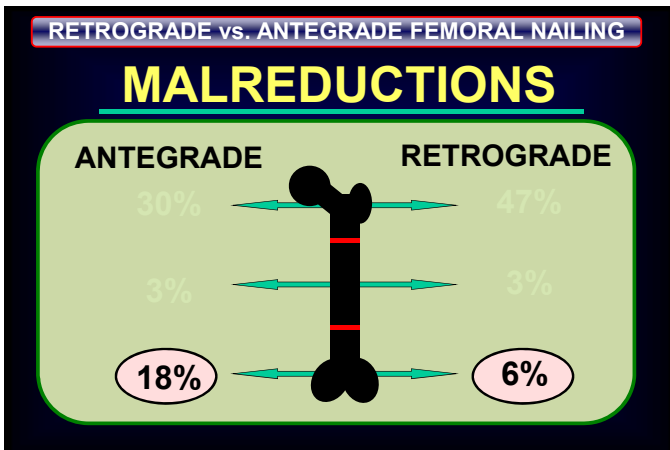
FEMUR DIVIDED

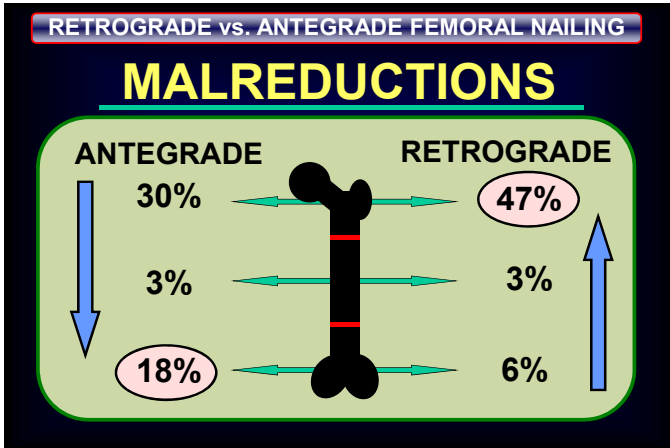
- PROXIMAL
- MIDDLE
- DISTAL











RETROGRADE vs. ANTEGRADE FEMORAL NAILING

RETROGRADE NAILING

JAN 1, 1991 - MARCH 31, 1998

CONCLUSIONS

ANTEGRADE NAILING OF
PROXIMAL FEMUR FRACTURES
IS
SUPERIOR

RETROGRADE vs. ANTEGRADE FEMORAL NAILING

RETROGRADE NAILING

JAN 1, 1991 - MARCH 31, 1998

CONCLUSIONS

RETROGRADE NAILING OF
DISTAL FEMUR FRACTURES
IS
SUPERIOR



RETROGRADE vs. ANTEGRADE FEMORAL NAILING

**TRANSVERSE, ISOLATED
MIDSHAFT FRACTURE**

↓

DEALER'S CHOICE
(I PREFER TROCH START)

RETROGRADE vs. ANTEGRADE FEMORAL NAILING

**COMMINUTED, ISOLATED
MIDSHAFT - WINQUIST III / IV**

↓

ANTEGRADE NAIL
(TROCANTERIC)

RETROGRADE vs. ANTEGRADE FEMORAL NAILING

**COMMINUTED, POLYTRAUMA
MIDSHAFT - WINQUIST III / IV**



RETROGRADE NAIL

RETROGRADE vs. ANTEGRADE FEMORAL NAILING

**COMMINUTED, ISOLATED
PROXIMAL – SUBTROCH FX**



**ANTEGRADE NAIL
(TROCHANTERIC)**

RETROGRADE vs. ANTEGRADE FEMORAL NAILING


**COMMINUTED, ISOLATED
MIDSHAFT - WINQUIST III / IV**



**ANTEGRADE NAIL
(TROCHANTERIC)**

RETROGRADE vs. ANTEGRADE FEMORAL NAILING

**COMMINUTED,
DISTAL SHAFT FRACTURE**



RETROGRADE NAIL
(BUT PROBABLY LOCKED PLATE NOW)



