

Guildal Lecture

Realistic Orthopaedics

Tim White

Edinburgh











































• Serves an immediate population of 800,000

• Tertiary referrals from 1.5 million





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• All orthopaedic trauma goes to one hospital





Serves an immediate population of 800,000

• Tertiary referrals from 1.5 million

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Nobody ever leaves



IN MEMORIAM

PAUL GUILDAL 1882-1950

Orthopaedic surgeons in Denmark have suffered a great loss through the death of Paul Guildal, who died on December 26, 1950, aged sixty-eight years.

VOL. 33 B, NO. 3, AUGUST 1951



The portrait of Guildal as the leading man in our profession is characterised by his wide knowledge of surgery, his love for classical orthopaedics and his distinctive practical mind and mechanical dexterity. But there was another aspect of his character,

-Guildal taught us not to give up

Treatment calls for planning and, if the situation changes, improvisation.





Discover your vocation, and never work again

Motivations



- Patients
- Colleagues
- Satisfaction
- Expertise
- Technical skills
- Research
- Development
- Identity



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Unpredictability

Pressure

Motivations



- Patients
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- Identity

Unpredictability

Pressure

• Inertia

- Fashion
- Fear of blame
- Stories
 - Peers
 - Industry
 - Big pharma



Realistic Orthopaedics





REALISTIC MEDICINE

Dr Catherine Calderwood Chief Medical Officer for Scotland 2014-20







Realism in Healthcare

Doctors generally choose less treatment for themselves than they provide for their patients.



Realism in Healthcare

Doctors generally choose less treatment for themselves than they provide for their patients.

In striving to provide relief from disability, illness and death, modern medicine may have overreached itself and is now causing hidden harm – or at best providing some care that is of lesser value.



Realism in Healthcare

a proportion of medical care may be prompted by "supplier induced demand"; healthcare that is provided in excess of patient/population potential to benefit, that is driven by a range of factors including legitimately held medical views, pressures from the manufacturers of medicines or equipment, perceived risk of litigation, and patient expectation in populations where treatment levels are high.





Dr Catherine Calderwood Chief Medical Officer for Scotland 2014-20







REALISTIC MEDICINE

Dr Catherine Calderwood Chief Medical Officer for Scotland 2014-20







Realistic Orthopaedics



- Clinic review: Trauma Triage Clinic
- Surgery: Posterior Malleolus
- Prophylaxis: Thromboprophylaxis

Realistic Orthopaedics



• Clinic review: TTC

- Surgery: Posterior Malleolus
- Prophylaxis: Thromboprophylaxis



1,300 trauma clinic referrals per month

















Affected party	Weakness
Patients	Long waits, crowded conditions.
	Time off work for attendance, cost of travel and parking.
	Spent < 5 mins with the clinician.
	Often seen by unsupervised junior doctors.
	Attendances were often unnecessary – minor self-limiting injuries already treated in emergency department.
	Unnecessary attendances to be referred to further, specialist clinic.
	Attendances often at an inappropriate time in natural history of injury.



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	Had little time available to spend with complex cases.



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Trainees	Large numbers of trainees required for service provision.
	Exposed to risk due to scarcity of consultant time for advice.
	Little educational value to clinics.
	Burden increased as training numbers reduced.



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Service	Large numbers difficult to accommodate comfortably and safely.
	Regular complaints about waiting times and patient experience.


The solution: TTC





ED referral protocol – on the wall in ED





























































satisfaction and comparable outcomes to conventional clinic model





■ TRAUMA



Discharged but not dissatisfied: outcomes and satisfaction of patients discharged from the Edinburgh Trauma Triage Clinic





























Lothian

Page 1 of 2













What You h	It is my diagnosis? ave fractured (broken) a small bone in the elbow called
This t this in	ype of injury is very common - hundreds of people have jury each year in Lothian. Almost all of these injuries ull without the need for any intervention or surgery.
You si to sup	hould have been provided with a collar-and-cuff (sling) port your arm for a few days.
Wha	thappens next? Your X-rays and notes will be checked by a Consultant Orthogaedic Surgeon
	If nothing further is needed, we will not contact you
	If any other treatment or assessment is needed we will contact you by telephone or post
•	Please make sure the Emergency Department/Minor Injury Unit reception staff have your mobile and home phone numbers
Wha	t can I expect during my recovery? The pain begins to settle after a week
•	The injury will heal over the course of 6 weeks but you may have some aching for up to 3 months
	You do not have to wear the sling. It is only used to provide comfort for a few days
	Regaining a full range of movement as soon as possible will speed up your recovery
•	Perform the exercises on the next page as soon as your pain allows you to do so
•	Most people return to desk work by 1 to 2 weeks, but manual work may not be possible fo 4 to 6 weeks depending on your symptoms
•	There is no specific time you can drive again. It is illegal to drive when wearing a sling, splint, cast, or moenboot. As you recover, it is your legal responsibility to be certain before you return to driving that you are able to control your vehicle normally and safety.











Lothian







Wh:	t is my diagnosis?
You h	ave fractured (broken) a small bone in your foot.
There	are lots of bones in the foot but breaks of these bones almost always heal fully without the
You n	up have been given some strapping for your toes or a supportive Velcro boot, often called a n boot".
Wha	t happens next? Your X-rays and notes will be checked by a Consultant Orthopaedic Surgeon.
	If nothing further is needed, we will not contact you
	If any other treatment or assessment is needed we will contact you by telephone or post
•	Please make sure the Emergency Department/Minor injury Unit reception staff have your mobile and home phone numbers
Wha	t can I expect during my recovery?
•	The injury will heal over the course of 6 weeks but you may have some aching for up to 3 months
•	You do not have to wear the moon boot. The boot should provide support to your foot and decrease pain. It does not need to be worn to make the bones heal and does not hold the bones togethere.
	Remove the boot every day to move your ankle and foot (see the exercises overleaf)
•	If you have a moonboot, it should be removed when sleeping
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Lothian

Page 1 of 2







Orthopaedics There are lots of bones in the foot but breaks of these bones almost always heal fully without the need for any intervention or surgery. You may have been given some strapping for your toes or a supportive Velcro boot, often called a "moon boot". What happens next? • Your X-rays and notes will be checked by a Consultant Orthopaedic Surgeo If nothing further is needed, we will not contact you · If any other treatment or assessment is needed we will contact you by telephone or post Please make sure the Emergency Department/Minor injury Unit reception staff have your mobile and home phone numbers What can I expect during my recovery? · The pain begins to settle after a few wee The injury will heal over the course of 6 weeks but you may have some aching for up to 3 You do not have to wear the moon boot. The boot should provide support to your foot and decrease pain. It does not need to be worn to make the bones heal and does not hold the bones together. · Remove the boot every day to move your ankle and foot (see the exercises overleaf) · If you have a moonboot, it should be removed when sleeping · Regaining a full range of movement as soon as possible will speed up your recovery Most people return to desk work by 1 to 2 weeks, but manual work may not be possible for 4 to 6 weeks depending on your symptoms There is no specific time you can drive again. It is illegal to drive when wearing a sling, splint, cast, or monhoot. As you recover, it is your legal responsibility to be certain before you return to driving that you are able to control your vehicle normally and safely. NHS Page 1 of 2 Lothian





Patient Information Sheet - 85 Foot and Toe Fractures What do I need to know?		
Wha	it is my diagnosis?	
Tou N	are intertured (protein) a small bone in your toot.	
need	for any intervention or surgery.	
You m "moor	ay have been given some strapping for your toes or a supportive Velcro boot, often called a n boot".	
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Page 1	da NHS	













Get in touch

Please get in touch via our trauma email if you have queries about your injury: traumaenquiriesRIE@nhslothian.scot.nhs.uk

If you do not receive a reply after 3 working days call our Monday-Friday helpline (8am-4pm): 0131 242 3410





• How many patients re-present after discharge?

• Do they come to harm?

What we needed to know now...











• February 2014 to December 2017

• Reviewed in 2021 (3-7 year follow up)

Patients referred to TTC





46,111





46,111 6,688

TTC

TTC Decision





46,111 6,688

TTC Decision
















46,111 6,688







46,111 6,688













	Mallet	Boxer's	Radial head	5thMT	Тое
N (6,688)	370	1621	1861	1916	920
Surgery	1	22	8	12	2



- 48-year-old man
 - Simple fall onto outstretched hand
 - Elbow pain
 - Diagnosis: radial head fracture





- 48-year-old man
 - Simple fall onto outstretched hand
 - Elbow pain
 - Diagnosis: radial head fracture
- Direct Discharge

- 48-year-old man
 - Simple fall onto outstretched hand
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 - Diagnosis: radial head fracture
- Direct Discharge





- 48-year-old man
 - Simple fall onto outstretched hand
 - Elbow pain
 - Diagnosis: radial head fracture
- Direct Discharge
- Stiff elbow







- 48-year-old man
 - Simple fall onto outstretched hand
 - Elbow pain
 - Diagnosis: radial head fracture







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 - Simple fall onto outstretched hand
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- 48-year-old man
 - Simple fall onto outstretched hand
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- 48-year-old man
 - Simple fall onto outstretched hand
 - Elbow pain
 - Diagnosis: radial head fracture
- X-rays reviewed by:
 - ED doctor
 - Reporting radiologist
 - TTC orthopaedic surgeon



S Edinburgh Orthopaedic Trauma

Recommendation



- Scrutiny of all available images
- Caution with soft tissue structural injuries:
 - Shoulder dislocations
 - Elbow dislocations
 - Carpal dislocations
 - Knee dislocations
 - Mid-tarsal dislocations





Protocol of Direct Discharge is safe and effective 99.3% patients able to self-manage without intervention





Protocol of Direct Discharge is safe and effective 99.3% patients able to self-manage without intervention

- More time for patients seen in clinic
- More time for training



Protocol of Direct Discharge is safe and effective 99.3% patients able to self-manage without intervention

- More time for patients seen in clinic
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Development:

- Greater confidence in safety
- Increasing proportion now discharged
- Increasing range of injuries now discharged









• Stable ankle fractures







• Stable ankle fractures













Seen once at 7-10 days XR Discharged



Range of injuries





Colles fractures



Beirs block reduction, and POP backslab in ED

Trained orthopaedic nurse





Colles fractures



Control XR 1/52 and 2/52, and softcast at 2/52

Trained orthopaedic physio





Colles fractures



Patient removes own softcast at 6/52

Olecranon

Range of injuries

• Over 70's non-operative



TRAUMA Prospective randomised trial of nonoperative *versus* operative management of olecranon fractures in the elderly

A. D. Duckworth,
N. D. Clement,Aims
The air
operatJ. E. McEachan,
T. O. White,
C. M. Court-Brown,
M. M. McQueenPatien
Patien

The aim of this prospective randomised controlled trial was to compare non-operative and operative management for acute isolated displaced fractures of the olecranon in patients aged ≥ 75 years. Patients and Methods

Patients were randomised to either non-operative management or operative management





• Scaphoid





- Scaphoid
 - 1000 "possible scaphoids" per year,
 - 140 confirmed
 - 130 on XR
 - 10 'occult' confirmed on MRI
 - 70 further imaging









- Scaphoid
 - 1000 "possible scaphoids" per year, 1 occult scaphoid
 - Young, sport, high energy see at 2/52 by orthopaedic physio
 - MRI if clinical signs persist



- Scaphoid
 - 1000 "possible scaphoids" per year, 1 occult scaphoid
 - Young, sport, high energy see at 2/52 by orthopaedic physio
 - MRI if clinical signs persist

The British Journal of Radiology, 85 (2012), 1098–1101 **MRI as a reference standard for suspected scaphoid fractures** ¹A D DE ZWART, MS, ^{1,4}F J P BEERES, MD, PhD, ³D RING, MD, PhD, ⁵L M KINGMA, MD, PhD, ²E G COERKAMP, MD, ¹S A G MEYLAERTS, MD, PhD and ¹S J RHEMREV, MD ¹Department of Surgery, Medical Center Haaglanden, The Hague, Netherlands, ²Department of Radiology, Medical Centre Haaglanden, The Hague, Netherlands, ³Department of Orthopaedic Surgery, Massachusetts General Hospital, Boston, MA, USA, ⁴Department of Surgery Leiden University Medical Centre, Leiden, Netherlands, and ⁵Department of Radiology, University Medical Centre Groningen, Groningen, Netherlands



Figure 1. All diagnoses of the 64 healthy volunteers scored by 5 radiologists (n=319).



- Scaphoid
 - 1000 "possible scaphoids" per year, 1 occult scaphoid
 - Young, sport, high energy see at 2/52 by orthopaedic physio
 - MRI if clinical signs persist
 - All others discharged with information and access



Other benefits of TTC



• Research clinics

• Osteoporosis service





- Arthroplasty, spines, paeds triage
- Physio review, scans first

Realistic Orthopaedics



- Clinic review: TTC
- Surgery: Posterior Malleolus
- Prophylaxis: Thromboprophylaxis

Pubmed citations – Posterior Malleolar Fractures











• Why Fix?

- PM fractures do poorly
- Subluxed ankle is disaster.

Why?










Receptor



















Clinical Case



Thanks to Dr Mikko Ovaska, Helsinki



- 30% complications
- 21% reintervention
- Wound infection
- Sural nerve injury
- Malreduction
- Hardware removal
- FHL scarring
- Evidence against

Complications Following Treatment of Supination External Rotation Ankle Fractures Through the Posterolateral Approach

Milton T. M. Little, MD¹, Marschall B. Berkes, MD¹, Lionel E. Lazaro, MD¹, Peter K. Sculco, MD¹, David L. Helfet, MD^{1,2}, and Dean G. Lorich, MD^{1,2}



Foot & Ankle International 34(4) 523–529 © The Author(s) 2013 Reprints and permission: sagepub.com/journalsPermissions.nav DOI: 10.1177/1071100713477626 fai.sagepub.com



Outcomes of posterior malleolar fixation in ankle fractures in a major trauma centre

Luckshmana Jeyaseelan¹, Nelson Bua¹, Lee Parker, Catrin Sohrabi, Amaury Trockels, Alexandros Vris, Nima Heidari, Francesc Malagelada*

Department of Trauma & Orthopaedics, The Royal London Hospital, Bart's Health NHS Trust, Whitechapel Road, London E1 1FR, United Kingdom

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- 30% complications
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- Wound infection
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- Malreduction
- Hardware removal
- FHL scarring
- Evidence against

Posterolateral Approach to the Displaced Posterior Malleolus: Functional Outcome and Local Morbidity

Jens Forberger, MD¹; Philipp V. Sabandal, MD²; Michael Dietrich, MD¹; Jan Gralla, MD³; Thomas Lattmann, MD¹; Andreas Platz, MD¹ Zurich, Switzerland





- 30% complications
- 21% reintervention
- Wound infection
- Sural nerve injury
- Malreduction
- Hardware removal



- FHL scarring with restricted hallux movement in 30%
- Evidence against

Contents lists available at ScienceDirect

Injury

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



Edinburgh Orthopaedic Trauma

- 30% complications
- 21% reintervention
- Wound infection
- Sural nerve injury
- Malreduction
- Hardware removal
- FHL scarring

• Evidence against

• Accurate reduction

Functional outcome and general health status after plate osteosynthesis of posterior malleolus fractures - The quest for eligibility



Maarten Mertens^a, Julia Wouters^a, Johannes Kloos^a, Stefaan Nijs^{a,b}, Harm Hoekstra^{a,b,*}

^a University Hospitals Le ^b KU Leuven - University **Long-T**

Long-Term Results of Ankle Fractures With a Posterior Malleolar Fragment

J.S. de Vries, MD, A.J. Wijgman, MD, I.N. Sierevelt, MSc, and G.R. Schaap, MD, PhD

International Orthopaedics (SICOT) (2012) 36:1929–1936 DOI 10.1007/s00264-012-1591-9

ORIGINAL PAPER

A retrospective study of posterior malleolus fractures

Hai-lin Xu • Xuan Li • Dian-ying Zhang • Zhong-guo Fu • Tian-bing Wang • Pei-xun Zhang • Bao-guo Jiang • Hui-liang Shen • Gang Wang • Guang-lin Wang • Xin-bao Wu

- 30% complications
- 21% reintervention
- Wound infection
- Sural nerve injury
- Malreduction
- Hardware removal
- FHL scarring
- Evidence against : systematic reviews



Ewout S. Veltman MD^{a,*}, Jelle J. Halma MD^b, Arthur de Gast MD, PhD^{a,b}

^a Clinical Orthopedic Research Center Midden Nederland, Utrecht, The Netherlands ^b Department of Orthopedic Surgery, Diakonessenhuis Utrecht, The Netherlands

review of the literature



- 30% complications
- 21% reintervention
- Wound infection
- Sural nerve injury
- Malreduction
- Hardware removal
- FHL scarring



Posterior fragments in AO Weber-B fractures: does open reduction and fixation improve outcome? The POSTFIX-trial, a multicenter randomized clinical trial.



<u>A.L. Franx</u>, F. Huizing, S.M. Verhage, E. Twiss, I.B. Schipper, J.M. Hoogendoorn Department of Traumasurgery, Haaglanden Medical Center, The Hague, The Netherlands

International OTA, Netherlands 2022



- 30% complications
- 21% reintervention
- Wound infection
- Sural nerve injury
- Malreduction
- Hardware removal
- FHL scarring

ORIF posterior fragment in AO Type B fractures:

- No differences in functional outcome and osteoarthritis after 1 year
- Longer follow-up is needed

• Evidence against : RCT

International OTA, Netherlands 2022

















So, if every intervention has a risk and a cost,

are there some PM fractures should be fixed ?





So, if every intervention has a risk and a cost,

are there some PM fractures should be fixed ?

Instability of the talus



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PATHOANATOMY OF POSTERIOR Malleolar Fractures of the Ankle

By NAOKI HARAGUCHI, MD, HIROKI HARUYAMA, MD, HIDEKAZU TOGA, MD, AND FUMIO KATO, MD

Investigation performed at the Tokyo Metropolitan Police Hospital and the Haruyama Hospital for Surgery, Tokyo, Japan









1.	2.	3.
Posterolateral – oblique	Transverse medial extension	Small shell
67%	19%	14%





We perform open reduction and fixation of a type-I fracture only when we detect persistent intra-articular displacement of the fragment after reduction of the lateral and, if present, medial malleolar fractures.

Type 1





We fix all one-part type-II fractures.

Type 2





For a type-II fracture with two fragments, we fix only the medial fragment of the two posterior fragments; fixation of this fragment makes the type-II fracture with two fragments equivalent to a type-I fracture.

Type 2

Bartoniceck and Mason classifications



Arch Orthop Trauma Surg (2015) 135:505–516 DOI 10.1007/s00402-015-2171-4

TRAUMA SURGERY

Article

Anatomy and classification of the posterior tibial fragment in ankle fractures

Jan Bartoníček · Stefan Rammelt · Karel Kostlivý · Václav Vaněček · Daniel Klika · Ivo Trešl

FOOT & ANKLE SOCIETY.

Pathoanatomy and Associated Injuries of Posterior Malleolus Fracture of the Ankle

Lyndon W. Mason, MBBCh, MRCS(Eng), FRCS(Tr&Orth)¹,

William J. Marlow, MBChB, MRCS(Eng)¹, James Widnall, MBChB, MRCS(Eng)¹, and Andrew P. Molloy, MBChB, MRCS(Ed), FRCS(Tr&Orth)¹ 2017, Vol. 38(11) 1229–1235 © The Author(s) 2017 Reprints and permissions: sagepub.com/journalsPermissions.nav DOI: 10.1177/1071100717719533 journals.sagepub.com/homelfai

Foot & Ankle Internationale

Haraguchi	Bartoniceck	Mason	Sagital	Axial	% XR	Management
3	1	1			<20	

Haraguchi	Bartoniceck	Mason	Sagital	Axial	% XR	Management
3	1	1			<20	Ignore PM

Haraguchi	Bartoniceck	Mason	Sagital	Axial	% XR	Management
3	1	1			<20	Ignore PM
1	2	2a			<25	

Haraguchi	Bartoniceck	Mason	Sagital	Axial	% XR	Management
3	1	1			<20	Ignore PM
1	2	2a			<25	lgnore PM Unless subluxed after LM/MM

Haraguchi	Bartoniceck	Mason	Sagital	Axial	% XR	Management
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2	3	2b			<25	

Haraguchi	Bartoniceck	Mason	Sagital	Axial	% XR	Management
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2	3	2b			<25	Fix - plates

Haraguchi	Bartoniceck	Mason	Sagital	Axial	% XR	Management
3	1	1			<20	Nolgnore PM
1	2	2a			<25	Ignore PM Unless subluxed after LM/MM
2	3	2b			<25	Fix - plates
	4	3			>33	

Haraguchi	Bartoniceck	Mason	Sagital	Axial	% XR	Management
3	1	1			<20	Nolgnore PM
1	2	2a			<25	Ignore PM Unless subluxed after LM/MM
2	3	2b			<25	Fix - plates
	4	3			>33	Fix – Plate or AP perc

Haraguchi	Bartoniceck	Mason	Sagital	Axial	% XR	Management
3	1	1			<20	Ignore PM
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2	3	2b			<25	Fix - plates
	4	3			>33	Fix – AP perc

Complex Fractures – Edinburgh Protocol



Haraguchi	Bartoniceck	Mason	Sagital	Axial	% XR	Management
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2	3	2b			<25	Fix - plates
	4	3	A		>33	Fix – AP perc





Medial double contour sign




Medial double contour sign









Posterolateral







Posterolateral

Posteromedial



Posterolateral

Posteromedial





Modified Posteromedial



Posterolateral



Posteromedial





Modified Posteromedial









Posterolateral

Posteromedial

Modified Posteromedial

Prone

Supine or recovery







Posterolateral

Prone

Posteromedial

Modified Posteromedial

Supine or recovery









Haraguchi	Bartoniceck	Mason	Sagital	Axial	% XR	Management
3	1	1			<20	Ignore PM
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2	3	2b			<25	Fix - plates
	4	3	A		>33	Fix – AP perc

















Haraguchi	Bartoniceck	Mason	Sagital	Axial	% XR	Management
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1	2	2a			<25	lgnore PM Unless subluxed after LM/MM
2	3	2b			<25	Fix - plates
	4	3			>33	Fix – AP perc

Edinburgh Data – selective percutaneous fixation



ORIGINAL ARTICLE

"A to P" Screw Versus Posterolateral Plate for Posterior Malleolus Fixation in Trimalleolar Ankle Fractures

Timothy J. O'Connor, MD,* Benjamin Mueller, MD, PhD,* Thuan V. Ly, MD,* Aaron R. Jacobson, DC,* Eric R. Nelson, MD,† and Peter A. Cole, MD* (*J Orthop Trauma* 2015;29:e151–e156)

Edinburgh Data – selective percutaneous fixation



ORIGINAL ARTICLE

"A to P" Screw Versus Posterolateral Plate for Posterior Malleolus Fixation in Trimalleolar Ankle Fractures

Timothy J. O'Connor, MD,* Benjamin Mueller, MD, PhD,* Thuan V. Ly, MD,* Aaron R. Jacobson, DC,* Eric R. Nelson, MD,† and Peter A. Cole, MD* (*J Orthop Trauma* 2015;29:e151–e156)

Surgical Techniques

Patients were treated with either AP lag screws or PL plate fixation. In the AP lag screw group, the fibula was fixed and the posterior malleolus reduced by ligamentotaxis. A







































Sarah J. Wordie, BSc (Hons), MBChB (Hons),^a Thomas H. Carter, BSc (Hons), MBChB, MRCS (Ed),^a Deborah MacDonald, BA (Hons), MCQI CQP,^a Andrew D. Duckworth, MSc, PhD, FRCSEd(Tr&Orth),^{a,b} and Timothy O. White, MD, FRCSEd(Tr&Orth), FFTEd^a



Fibular nail cohort - >65, diabetic

94% uneventful union, OMS 80





Haraguchi	Bartoniceck	Mason	Sagital	Axial	% XR	Management
3	1	1			<20	Ignore PM
1	2	2a			<25	lgnore PM Unless subluxed after LM/MM
2	3	2b			<25	Fix - plates
	4	3			>33	Fix – AP perc



- "More information"
- Change management?



- "More information"
- Change management?
- Only those you are likely to fix!



- "More information"
- Change management?
- Only those you are likely to fix!

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Clinical Research

Can Lateral X-Rays Reliably Determine Which Posterior Malleolus Ankle Fractures Need a CT?

Ayush Thomas, BS¹, Ryan Fredette, BS², George Han, BA³, Patrick Curtin, MD⁴, and Eric Swart, MD ⁽¹⁾₅

- 276 patients with PM fracture
- 98 (35%) CT
- 48 (17%) surgery
- < 20% on lateral XR
- Reproducibly <25% on scan
- Didn't fix
- Could halve number of CTs



- "More information"
- Change management?
- Only those you are likely to fix!

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• Could halve number of CTs





• Some posterior malleolar fractures should be fixed

....but most don't.

• Some posterior malleolar fractures should be fixed

....but most don't.

SUMMARY

• Uncritical use of CT scanning and fixation risks complications







 Some posterior malleolar fractures should be fixed

....but most don't.

• Uncritical use of CT scanning and fixation risks complications

• Consider AP screws after adequate reduction






Posteromedial approach

SUMMARY

 Some posterior malleolar fractures should be fixed

....but most don't.

- Uncritical use of CT scanning and fixation risks complications
- Consider AP screws after adequate reduction









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Scott's Parabola





Scott's Parabola





Realistic Orthopaedics



- Clinic review: TTC
- Surgery: Posterior Malleolus
- Prophylaxis: Thromboprophylaxis



Is there a role for thromboprophylaxis after ankle fractures?



Is there a role for thromboprophylaxis after ankle fractures

... or other lower limb surgery?



Is there a role for thromboprophylaxis after ankle fractures

... or other lower limb surgery?

No





Emotive cases



Emergency Care Journal 2014; volume 10:4473

Fatal pulmonary embolism following ankle fracture in a 23-year-old man

Stella Charitidou,¹ Theodoros Aslanidis,² Stellios Papalexandris³

¹Emergency Department, General Hospital of Ptolemaida; ²Mobile Intensive Care Units, National Center of Emergency Care, Thessaloniki Department, Greece; ³Private Orthopedic Surgeon, Manchester, UK



CASE REPORT

Fatal pulmonary embolism following ankle fracture in a 17-year-old girl

L. Chen, D. Soares

From Logan Hospital, Queensland, Australia We report a case of fatal pulmonary embolism following a simple ankle fracture in a 17year-old girl. The diagnosis was confirmed at post-mortem. The risk factors for deep venous thrombosis and pulmonary embolism and their significance in orthopaedic fracture management are discussed.

JBJS (Br) 2006 ; 88 : 400

Medicolegal concern









- What do we mean by a VTE event?
- What is the underlying rate of VTE?
- Is this changed by thromboprophylaxis?
- What is the absolute risk reduction (ARR)?
- Does that make it cost effective?
- Do the benefits outweigh the risks?







< 30 %

















- What do we mean by a VTE event?
- What is the underlying rate of VTE?
- Is this changed by thromboprophylaxis?





Cochrane Database of Systematic Reviews

Low molecular weight heparin for prevention of venous thromboembolism in patients with lower-limb immobilization (Review)

Zee AAG, van Lieshout K, van der Heide M, Janssen L, Janzing HMJ

2017, updated from 2008 + Knee arthroscopy 2022







3680 Patients from 8 RCTs:

- Lower limb
 - Foot and ankle fractures
 - Tendo Achilles ruptures
- Operative and non-operative
- Cast or brace
- WB and NWB





	No prophylaxis per 1000	LMWH per 1000	Effect
DVT			
PE			





	No prophylaxis per 1000	LMWH per 1000	Effect
DVT			
PE			
CIVTE			
Mortality			
Adverse effects			





	No prophylaxis per 1000	LMWH per 1000	Effect
DVT	174	87	0.45 (0.33-0.61) P=0.03
PE	7	4	0.5 (0.17 - 1.47) P = NS





	No prophylaxis per 1000	LMWH per 1000	Effect
DVT	174	87	0.45 (0.33-0.61)
PE	7	4	0.5 (0.17 – 1.47)
CIVTE	21	9	0.4 (0.21 – 0.76)
Mortality	0	0	





	No prophylaxis per 1000	LMWH per 1000	Effect
DVT	174	87	0.45 (0.33-0.61)
PE	7	4	0.5 (0.17 – 1.47)
CIVTE	21	9	0.4 (0.21 – 0.76)
Mortality	0	0	
Adverse effects	40	78	2 (0.83 – 84.86)







JOT 2015 ; 29 ; 224-30

1926 screened

Surgically treated fractures Age >16 13 Canadian hospitals









2	CIVTE	3
2	DVT	2
0	PE	1
2	Minor bleeding	1



	2	CIVITE	2
	5	CIVIE	۷
2% overall	2	DVT	2
rate CIVTE	1	PE	0
	1	Minor bleeding	2



2	CIVTE	3
2	DVT	2
0	PE	1
2	Minor bleeding	1



Unable to show an effect -even if groups doubled in size –

Steering committee stopped study early






Injuries of the leg Treated in cast With or without surgery

> 479 ankle fractures 94 TA ruptures





2500 iu daily Duration of cast (3-7 weeks)



10	CIVTE	13
6	DVT	8
3	PE	4
1	Minor bleeding	0



10	CIVTE	13
6	DVT	8
3	PE	4
1	Minor bleeding	0

1.4% vs 1.8%
CIVTE
-ns

Conclusions from two RCTs



• Incidence of CIVTE is low

Conclusions from two RCTs



- Incidence of CIVTE is low
- Prophylaxis is ineffective in reducing these events





- What do we mean by a VTE event?
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- Is this changed by thromboprophylaxis?
- What is the absolute risk reduction (ARR)?





- What do we mean by a VTE event?
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CIVTE rate reduction from 1.7% to 1% Low ARR and high NNT





- What do we mean by a VTE event?
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- Is this changed by thromboprophylaxis?
- What is the absolute risk reduction (ARR)?
- Do the benefits outweigh the risks?

Do the benefits outweigh the risks?



Practice review



Thromboprophylaxis in lower limb immobilisation after injury (TiLLI)

Daniel Horner (1,2), ^{1,2} Steve Goodacre (1,2), ² Abdullah Pandor, ² Timothy Nokes, ³ Jonathan Keenan, ³ Beverley Hunt, ⁴ Sarah Davis (1,2), ² John W Stevens, ⁵ Kerstin Hogg⁶



Table 1 P	redicted	licted clinical outcomes per 100 000 patients with lower limb immobilisation due to							
Outcomes at 6 months per 100 000 patients									
7	Fatal PE	Fatal bleed	Non-fatal ICH	Other major bleed*	Non-fatal PE	Symptomatic DVT	Asymptomatic DVT		
No prophylaxis	12	9	5	26	415	907	7052		
Prophylaxis	7	12	8	35	225	492	3820		



Table 1 Predicted clinical outcomes per 100 000 patients with lower limb immobilisation due to							
Outcomes at 6 months per 100 000 patients							
2	Fatal PE	Fatal bleed	Non-fatal ICH	Other major bleed*	Non-fatal PE	Symptomatic DVT	Asymptomatic DVT
No prophylaxis	12	9	5	26	415	907	7052
Prophylaxis	7	12	8	35	225	492	3820



Table 1 F	redicted	clinical o	outcomes per	r 100 000 j	patients with	lower limb imm	obilisation due to	
	Outcomes at 6 months per 100 000 patients							
×	Fatal PE	Fatal bleed	Non-fatal ICH	Other major bleed*	Non-fatal PE	Symptomatic DVT	Asymptomatic DVT	
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Prophylaxis	7	12	8	35	225	492	3820	

10:100000 patients significantly harmed (plus HiT...)



Table 1 P	redicted	dicted clinical outcomes per 100 000 patients with lower limb immobilisation due to						
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3,000 avoid asymptomatic DVT



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3,000 avoid asymptomatic DVT, 600 patients avoid a CIVTE



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No prophylaxis	12	9	5	26	415	907	7052			
Prophylaxis	7	12	8	35	225	492	3820			

3,000 avoid asymptomatic DVT, 600 patients avoid a CIVTE, 120 proximal segment

Horner, Emerg Med J 2020

Do the benefits outweigh the risks?



Post-thrombotic syndrome

- Of 120 : 100,000, if treated promptly, how many PTS?
- How much of a problem is that?



Do the benefits outweigh the risks?



Post-thrombotic syndrome

- Of 120 : 100,000, if treated promptly, how many PTS?
- How much of a problem is that?

vs • 10 : 100 000 patients significantly harmed







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Incremental cost-effectiveness ratio for thromboprophylaxis: £13,524 NICE threshold level £20,000 NOT cost effective





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CIVTE





- What do we mean by a VTE event?
- What is the underlying rate of VTE?
- Is this changed by thromboprophylaxis?
- What is the absolute risk reduction (ARR)?
- Do the benefits outweigh the risks?
- Does that make it cost effective?

CIVTE 1.7%



Key concepts

• What do we mean by a VTE event?

Key concepts

- What is the underlying rate of VTE?
- Is this changed by thromboprophylaxis?
- What is the absolute risk reduction (ARR)?
- Do the benefits outweigh the risks?
- Does that make it cost effective?

CIVTE 1.7% Yes, to 1%



- What do we mean by a VTE event?
- What is the underlying rate of VTE?
- Is this changed by thromboprophylaxis?
- What is the absolute risk reduction (ARR)?
- Do the benefits outweigh the risks?
- Does that make it cost effective?

CIVTE 1.7% Yes, to 1% Low: 0.7%





• What do we mean by a VTE event?

Key concepts

- What is the underlying rate of VTE?
- Is this changed by thromboprophylaxis?
- What is the absolute risk reduction (ARR)?
- Do the benefits outweigh the risks?
- Does that make it cost effective?

CIVTE 1.7% Yes, to 1% Low: 0.7%

Probably not



- What do we mean by a VTE event?
- What is the underlying rate of VTE?
- Is this changed by thromboprophylaxis?
- What is the absolute risk reduction (ARR)?
- Do the benefits outweigh the risks?
- Does that make it cost effective?

CIVTE 1.7% Yes, to 1% Low: 0.7% Probably not No









• Is there any role for thromboprophylaxis?





• Is there any role for thromboprophylaxis?

High Risk Patients

Risk Assessment



- Select patients at higher baseline risk
 - Greater clinical and cost effectiveness

Risk Assessment Models



Environmental Predictor Variable	Point Value
Age \geq 35 and < 55 y	2
Age \geq 55 y	3
Male sex	1
Current use of oral contraceptives	4
Cancer within the past 5 y	3
Pregnancy or puerperium	3
$BMI \ge 25 \text{ and} < 35 \text{ kg/m}^2$	1
$BMI \ge 35 \text{ kg/m}^2$	2
Pneumonia	3
Family history of VTE (first-degree relative)	2
Comorbidity (rheumatoid arthritis, chronic kidney disease, COPD, multiple sclerosis)	1
Hospital admission within the past 3 mo	2
Bedridden within the past 3 mo	2
Surgery within the past 3 mo	2
Superficial vein thrombosis	3
Plaster cast: complete leg	5
Plaster cast: circular knee cast (ankle free)	2
Plaster cast: foot	2
Plaster cast: lower leg	4

Nemeth et al, PLOS Medicine 12 (11) 2015



- Limited evidence base
- Uncertain whether the same risk reduction applies

Individualised risk assessment Shared decision making





Is there a role for thromboprophylaxis after ankle fractures?





Is there a role for thromboprophylaxis after ankle fractures

...and most lower limb surgery?

No

Probably a role for risk assessment, and shared decision with patient
Summary





Motivations



- Patients
- Colleagues
- Satisfaction
- Expertise
- Technical skills
- Research
- Development
- Identity

Unpredictability

Pressure

• Inertia

- Fashion
- Fear of blame
- Stories
 - Peers
 - Industry
 - Big pharma







IN MEMORIAM

PAUL GUILDAL 1882-1950

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VOL. 33 B, NO. 3, AUGUST 1951



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