

Thromboprophylaxis for THR

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What is risk?

- Incidence
 - Asymptomatic DVT 41-85%
 - Proximal DVT 5-36%
- Peak onset
 - Day 4
- Elevated Risk
 - At least 18 days

What is risk?

- Previous VTE
- BMI $>30\text{kg/m}^2$

But

- Data related to old studies
- Doesn't take into consideration modern practice
- ?what actual risk is
- **Nothing reduces risk of fatal PE!**
—(0.1% -1%)

Guidelines

- NICE (2010)
- Sign (2010)
- ACCP (2008)

NICE

- Offer combined prophylaxis
- Mechanical
 - Stockings (with caution)
 - Foot impulse device/pneumatic compression
- Pharmacological
 - Dabigatran/rivaroxaban
 - Fondaparinux
 - LMWH

SIGN

- Pharmacological
 - LMWH
 - Fondaparinux
 - Rivaroxaban/Dabigatran
- Mechanical

ACCP

- LMWH
- Fondaparinux
- Warfarin

- Recommend against
 - Aspirin, dextran, LDUH, GCS, foot pumps alone

Anaesthetic

- Spinal/epidural reduces risk
 - Sympathetically induced vasodilatation
 - ↓periop hypercoagulability

Louden et al. Br J Surgery 1978;65:616-8

Davis et al. JBJS(Br)1989;71B:181-5

Hu et al. JBJS 2009;91B:935-942

Mechanical Prophylaxis

- Stockings
 - No evidence that AK better than BK
 - Only 1 type meet Siegel profile (Thrombexin)
 - Hui et al
 - THR & BK stockings ↑rate proximal/major calf DVT
 - Small numbers
 - 22 control, 24 AK, 18 BK

NICE Guidance 2010

- Evidence considered RCTs level 1+ or 1++ or systematic reviews of RCTs
- 71 trials included
- Network meta-analysis

Abbreviations

- VKA = Vit K agonist (warfarin)
- UFH = Unfractionated heparin
- MB = Major Bleeding
- GCS = Graduated compression stockings
- LMWH = Low molecular weight heparin
- FON = Fondaparinox
- IPCD = Intermittent pneumatic compression device

DVT

	Relative risk	95% CI
UFH then Asp HD	2.06	1.04 - 2.19
Asp HD +GCS	0.71	0.07 – 1.91
Asp HD	0.66	0.45 – 0.91
VKA	0.64	0.39 – 0.92
IPCD/FID	0.54	0.34 – 0.81
UFH	0.50	0.37 – 0.64
Asp HD + UFH	0.50	0.1 – 1.39
Asp LD	0.47	0.22 – 0.81
GCS	0.43	0.11 – 1.05
LMWH	0.36	0.25 – 0.48
VKA + GCS	0.35	0.04 – 1.44
IPCD + UFH	0.28	0.08 – 0.79
LMWH + GCS	0.21	0.05 – 0.59
UFH + GCS	0.17	0.04 – 0.57
IPCD + UFH THEN Asp HD	0.13	0.00 – 1.81
FON + GCS	0.11	0.03 – 0.38

PE

	Relative risk	95% CI
LMWH +GCS	0.06	0.00 - 1.04
VKA	0.09	0.01 – 0.89
LMWH	0.10	0.02 – 0.57
GCS	0.14	0.00 – 7.50
Fon + GCS	0.14	0.00 – 4.41
Asp HD	0.18	0.02 – 1.12
UFH + GCS	0.20	0.00 – 6.67
IPCD + UFH then Asp HD	0.29	0.00 -22.15
UFH	0.86	0.22 – 2.41
Asp LD	0.89	0.04 – 11.10
IPCD/FID	1.05	0.03 – 14.47
UFH then Asp HD	8.62	0.06 – 24.58

Major Bleeding

	RR	95% CI
UFH + VKA	4.09	0.11 – 40.52
Asp HD + UFH	4.00	1.50 – 10.68
Fondaparinux	3.29	1.91 – 5.83
Rivaroxaban	3.16	1.05 – 9.19
UFH	2.11	1.58 – 2.83
LMWH	1.85	1.37 – 2.52
VKA	1.82	1.22 – 2.73
Dabigatran	1.31	0.45 – 3.66
Asp HD	0.66	0.26 – 1.57

Summary – intervention v nil

	DVT	PE	MB
GCS	Not sig	Not sig	n/a
IPC/FID	IPC/FID	Not sig	n/a
Asp LD	Asp LD	Not sig	No data
Asp HD	Asp HD	Not sig	No sig
VKA	VKA	VKA	Not sig
UFH	UFH	Not sig	No pro
LMWH	LMWH	LMWH	No pro

Summary – intervention v nil

	DVT	PE	MB
Asp HD + GCS	Not sig	No data	Not sig
VKA + GCS	Not sig	No data	Not sig
UFH + GCS	UFH + GCS	Not sig	No pro
LMWH + GCS	LMWH + GCS	Not sig	No pro
Fon + GCS	Fon + GCS	Not sig	No pro
UFH + IPC/FID	UFH + IPC/FID	No data	No pro
IPCD = UFH then Asp HD	Not sig	Not sig	No data
Asp HD + UFH	Not sig	No data	No pro
UFH then Asp HD	nil	Not sig	No data

Summary – post discharge v nil

	DVT	PE	MB
LMWH	LMWH	Not sig	Not sig
UFH	Not sig	No data	No events
VKA	No data	Not sig	Not sig

intervention	comparison	DVT	PE	MB
Dabigatran	LMWH	Not sig	Not sig	Not sig

Other evidence

- Cusick et al JBJS 2009 91B 645 -8
 - NJR data 2003 -6
 - 2203 THR
 - Mortality 1yr 1.9%
 - No difference with type VTE prophylaxis
 - 0.33% proximal DVT, 0.66% non fatal PE
 - 0.05% THR mortality at 90 days due PE

- Parry et al JBJS 2008 90B 306-9
 - 75mg Aspirin + GCS no deaths at 90 days
 - 1549 patients

- Jameson et al JBJS 2010 92B 123-9
 - Review practice pre & post 2007 NICE guidelines
 - ↑use LMWH
 - VTE pre 1.69% post 1.84%
 - TCP pre 0.11% post 0.16%

Oral Agents

- Published studies funded by manufacturers!!
- RENOVATE - Dabigatran
- RECORD - Rivaroxaban

RENOVATE

- 3494 patients, extended, vs enoxaparin
- No difference rate proximal, distal DVT
- No difference symptomatic VTE, PE, death
- ? Data re wound problems
- Conclusion: Dabigatran non inferior to enoxaparin

RECORD

- 3153 patients, extended, vs enoxaparin
- ↓incidence 1^o outcome measure
- Incidence bleeding 0.3% Rivaroxaban and 0.1% enoxaparin
- ? Reporting of adverse effects
- Conclusion: Rivaroxaban more effective than current chemoprophylaxis

Adverse effects

- LMWH
 - HIT 0.2% incidence, 15 -30% mortality
- Dabigatran
 - Need to monitor LFTs (↑ALT)
- Rivaroxaban
 - Risk surgical site bleeding/haematomas/wound ooze

PTS

- Does it happen?
- Is it a problem
- Reported occurs 20 - 70% post DVT
- Incidence 21% after DVT post THR

- Fitzgerald et al
 - 1037 patients
 - 3/14 who had DVT, 3/91 no DVT

Future

- Adequate trial data
 - Probably never happen
 - Need minimum 30000 patients in each arm
 - Retrospective data from registries helps
 - Need appropriate engagement and data collection

My Practice

- Actual
 - IPCD started on table
 - LMWH post op whilst in hospital
 - Rivaroxaban on discharge for 35 days
- Preference
 - IPCD started in table
 - Dabigatran post op