



Deep Venous Thrombosis Prevention

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Introduction

- Risk of Post-Operative DVT's in patients undergoing surgeries especially orthopedic & abdominal, are well documented, (2/1000, post op VTE Australian and O/S data)
- Incidence has been reduced with improved measures such as heparin/LMWH, reduced post op immobilisation, aspirin.



DVT

- **DVT / PE Data & Statistics – United States**
- *Deep Vein Thrombosis (DVT) / Pulmonary Embolism (PE) — Blood Clot Forming in a Vein*
<http://www.cdc.gov/ncbddd/dvt/data.html>
- The precise number of people affected by DVT/PE is unknown, but estimates range from 300,000 to 600,000 (1 to 2 per 1,000, and in those over 80 years of age, as high as 1 in 100) each year in the United States.
- Estimates suggest that 60,000-100,000 Americans die of DVT/PE (also called venous thromboembolism).
 - 10 to 30% of people will die within one month of diagnosis.
 - Sudden death is the first symptom in about one-quarter (25%) of people who have a PE.
- Among people who have had a DVT, one-half will have long-term complications (post-thrombotic syndrome) such as swelling, pain, discoloration, and scaling in the affected limb.
- One-third (about 33%) of people with DVT/PE will have a recurrence within 10 years.



Chronic Venous Disorder

- ***What are the risk factors for chronic venous insufficiency?***
- If you have risk factors for CVI, you are more likely than other people to develop the disease. The most important risk factors are:
 - Deep vein thrombosis (DVT)
 - Varicose veins or a family history of varicose veins
 - Obesity
 - Pregnancy
 - Inactivity
 - Smoking
 - Extended periods of standing or sitting
 - Female sex
 - Age over 50
- **Who is affected by chronic venous insufficiency?**
- An estimated 40 percent of people in the United States have CVI. It occurs more frequently in people over age 50, and more often in women than in men.





Aim

Test Post op (orthopedic) LMWH +/- CCD Therapy

- **To Assess the Incidence of**
 - ⇒ **DVT/ PE**
 - ⇒ **Bleeding / bruising**
 - ⇒ **Leg swelling**
 - ⇒ **Infection Risks, and**
 - ⇒ **Measure Overall Hospital Stay**



Methods

○ Patients Selected

- ⇒ Those who have undergone hip / knee replacement

○ Patients Excluded

- ⇒ 18 – 85 Ages
- ⇒ Morbid Obesity
- ⇒ Level Limb Oedema
- ⇒ Active Malignancy
- ⇒ Mental Disorders



Results

- **84 patients enrolled with only 3 withdrawing & 2 lost to follow up.**
- **There were 42 Female & 37 male – mean age 72**



Asprin Study data

Aspirin Study Statistical Occurrence of DVT

	TKR	TKRWC	THR	Total
Total Patients	521	202	472	790
Total with Aspirin	40	3	16	59
Total with Aspirin who experienced DV	0	2	0	2
Total without Aspirin	482	17	233	732
Total without Aspirin who experienced DVT	2	0	0	2



Doppler data

- Aspirin Doppler Database
- Patient Surname Patient First Name Gender DOB DOS Doppler
- Doppler Flow Pedder Terry M 3/08/1943 11/11/2010 Negative N/A Murray Marilyn F 15/07/1950
- 7/10/2010 Negative 46-47 Ullrich Rita F 15/07/1957 14/10/2010 Negative 43-50 Chandler Colin M
- 20/03/1937 21/10/2010 Negative 12-20 Jones Sue F 31/01/1951 21/10/2010 Negative 40-41
- Martin Rudolph M 6/07/1936 27/01/2011 Negative 76-150 Hristias Ekaterini F 19/02/1935
- 15/05/2008 Negative N/A Parker Elaine F 27/05/1940 22/05/2008 Negative N/A Gillett Beverley F
- 15/02/1942 26/02/2009 Negative N/A Garabedian Sophy F 6/11/1938 18/11/2010 Negative N/A
- Lee Dian F 19/03/1945 29/04/2008 Positive N/A Gentle Kenneth M 25/05/1942 23/04/2008
- Negative N/A Niemeyer Sigrid F 26/06/1941 23/04/2008 Negative N/A Hatton Reginald M
- 28/01/1942 23/04/2008 Negative N/A Hunter James M 18/03/1945 14/07/2011 Negative N/A Da
- Silva Frank M 2/05/1953 12/08/2010 Positive N/A Floyd Michael M 25/12/1949 12/05/2011
- Negative N/A Valencia Zenaida F 7/02/1933 23/07/2008 Negative N/A Marshall John M 8/02/1931
- 21/07/2008 Negative N/A Battese Noel M 15/03/1938 23/07/2008 Positive N/A Machiavello Mario
- M 7/11/1938 20/11/2008 Negative N/A Kerr Carolyn F 6/08/1939 20/11/2008 Clancy Patricia F
- 15/05/1944 14/04/2008 Halse Robert M 21/06/1937 14/04/2008 Ashford Pauline F
- 12/06/1936 16/04/2008 Negative N/A Antonios Mona F 28/05/1954 10/03/2011 Negative 20-27
- Edwards Allan M 4/01/1947 15/01/2009 Negative N/A Acsai Karoly F 21/03/1955 16/12/2008
- Negative N/A Caldwell Pamela F 20/06/1937 8/12/2008 Burling Anna F 8/09/1941
- 9/12/2008 Martorano Domenico M 23/05/1931 9/12/2008 Negative N/A Collins Richard M
- 23/09/1953 7/10/2010 Negative 28-35 Hoult Rodney M 26/04/1945 21/10/2010 Chalker Alan M
- 31/03/1948 4/11/2010 Negative 40-68 Glen Douglas M 18/11/1947 4/11/2010 Moussa Rana F
- 15/12/1964 21/10/2010 Negative 27-42 Avialiotis Flora F 23/10/1940 17/02/2011 Whittemore
- Charles M 3/05/1952 10/02/2011 Negative 20-24 Mccarthy Terrence M 12/02/1947 2/06/2011
- Negative N/A Boroczky Stephen M 29/10/1961 N/A Negative 22-36 Herrera Carlos M 10/07/1943
- N/A Negative 3.3-5.8



Conclusion

- There was no increased incidence of DVT in patients receiving shorter duration of LMWH & CCD compared with standard LMWH injections.**
- Similar results were observed when aspirin and CCD were used in low risk surgery patients**
- Therefore CCD is safe and reduces risk of DVT & other complications, post op.**



CCD models: issues

- CCDs are hospital used and for bed bound patients.
- Mobile CCD units were designed to help continued use for patients once they are mobile and at home
- Various models have been trialed and compared with the pressures achieved with hospital models.
- Clinical trials (phase I and II) have shown that portable CCD are safe and effective





Portable CCD: Future Directions

- Modify current model to suite individual needs
- Further clinical research/ trials and application in patients with Chronic Venous Disorder, Varicose Veins or chronic venous leg ulcers.