

The Benefits of Physiotherapy: exercise and fitness, maintaining healthy joints, optimizing prophylaxis

Kathy Mulder, BPT
Canada

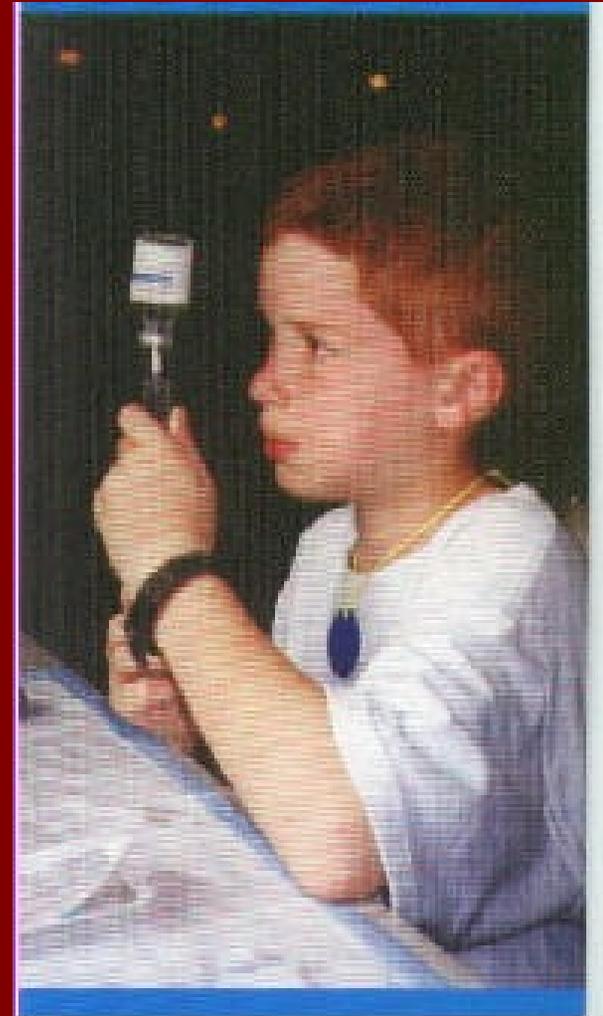


Comprehensive Care

- Hematology
- Nursing
- **Physiotherapy**
- Psychosocial
- (Orthopedics)

Haemophilia and Physiotherapy

- **1960's:** cryoprecipitate and then Factor VIII concentrates become available
- P.T. 'without tears'
 - Factor Pre-physio
- **Post-operative P.T.**
 - Surgical synovectomy
 - Corrective surgery
 - Joint replacement



Physiotherapy

- Education to parents and patients
- Prevent bleeds
- Treat bleeds



Myths

- “Treatment” means “factor”
- People with Mild Hemophilia do not get joint disease
- Joint disease will become extinct because of prophylaxis

Challenges

- Primary prophylaxis
- Home infusion programs
- Sports selection
- Obesity and overweight
- Using factor wisely

Primary Prophylaxis

- Prevent bleeding ‘before it starts’
 - Started young OR after first bleed
 - “Turn severe hemophilia into mild hemophilia”
 - “Allows a ‘normal’ life style”

But.....

- Children on prophylaxis *still get joint damage*
 - Shown on MRI
 - Even with NO clinical history of bleeding!
(Manco-Johnson)
- People with Mild Hemophilia also get joint damage (Scully)

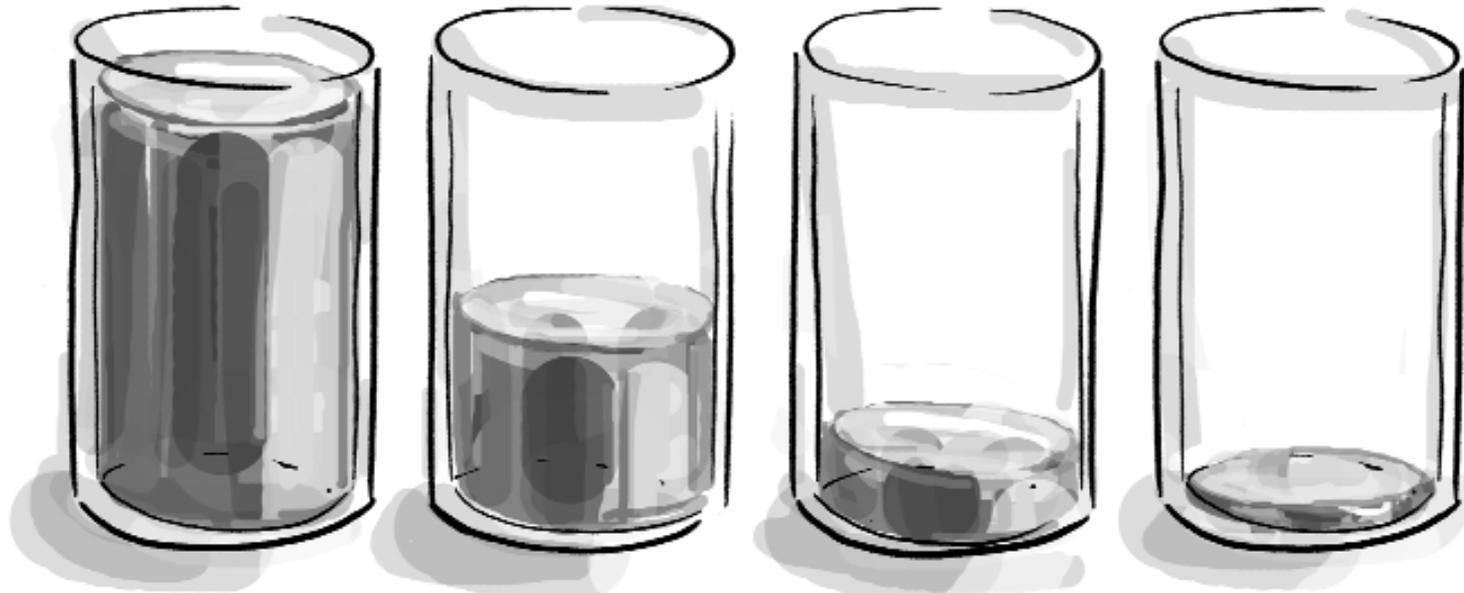
WHY??

- Prophylaxis does not make the clotting 100% 'normal'
 - Raises levels but does not 'normalize' levels
 - Severe hemophilia becomes Mild hemophilia
 - *BUT IT IS STILL HEMOPHILIA*

WHY???

- Half life of factor
 - VIII 8-12 hours
 - IX 18-24
- “traditional proph” (alternate days)
Severe → Mild → Moderate →
Severe again within 48 hours

Half Life



**After
infusion,
40 % FVIII**

**After 12
hours,
half of 40%
= 20%.
Mild
Hemophilia**

**After 24
hours, half
of 20%
remains
=10%**

**After 36
hours, half
of 10%
remain,
=5%
Moderate
hemophilia**

Take home point

- Timing is everything
 - Infuse in the morning, not at bed time
 - Participate in sports and activities according to your prophylaxis days

Home Treatment

- Advantages:
 - Convenience
 - EARLY infusion → less blood in joint
- BUT:
Families make treatment decisions alone

Treatment is more than just factor replacement.

– *Mark Skinner, President of WFH*

Home Treatment

- Bleeds happen.
- Treatment Steps:
 - Ice ?
 - Infusion - yes

WHAT ABOUT REST????

WHY???

- Blood in a joint affects the *synovium* and *the cartilage*
- Synovium:
 - Role is to produce fluid for lubrication and nutrition of the cartilage
 - After a bleed, it becomes over-active
 - Enzymes harm cartilage

So what?

- Even though the blood is cleared quickly, the synovium remains inflamed for AT LEAST 2 weeks
- If a new bleed begins in this period, it ADDS to the inflammation
- Secondary prophylaxis and/or synovectomy are required early
 - to de-activate the synovium
 - to slow the progression

But that's not all!

- Research in Netherlands has shown that blood harms the cartilage *directly*:
- Blood in a joint is bad for cartilage
- More blood is worse than a little blood
- *Weight-bearing when there is blood in the joint is worse still*

Wait, there's more....

- Blood on young cartilage is still worse
- Blood on damaged cartilage is bad too

- *Cartilage cells remain disorganized for at least two weeks after a bleed. Cells break down and die and are not replaced.*

Take home messages

- The cycle of joint damage is – sadly - set in motion after even one bleed
- The cartilage cells remain in a fragile state *for at least two weeks.*
- So REST those joints when they bleed!!!!
 - That means stay off them!!!
 - We're not really sure for how long.....

References

- Jansen, Roosendaal et al : Exposure of human cartilage tissue to low concentrations of blood for a short period of time leads to prolonged cartilage damage: an in vitro study. *Arth and Rheum* 2007
- Roosendaal et al: Articular cartilage is more susceptible to blood induced damage at young than at old age. *Journal of Rheumatology* 27, 1740-44. 2000.
- Jansen et al: Degenerated cartilage is as vulnerable to blood induced damage as healthy cartilage is. *Ann Rheum Dis* 2007
- Jansen et al: Very rapid clearance after a joint bleed in the canine knee can not prevent adverse effects on cartilage and synovial tissue. *Osteoarthritis and Cartilage*- 2008

Sports and activities

- Physical Activity is good.
 - Fun
 - Muscle strength and coordination
 - Joint mobility
 - Weight control
 - Cardiovascular fitness
 - Bone density

However.....

PWH in the developed world have begun participating in more 'risky' sports:

(Might not be a new phenomenon)

- Because they can *pre-treat* with factor
- Because they can *treat injuries* with factor

Sports and Activities

- Australia
 - Aussie rules, rugby
 - surfing
- Canada
 - Ice hockey
 - snowboarding

Boys will always be boys

Choosing sports and activities: things to consider

The Sport:

- Contact or collision?
- Speed?
- Type of injuries?
 - Head, neck, abdomen
- Equipment needed?
- Facilities & coaching?
- Weight-bearing or non-weight-bearing?*

Your own body:

- Target joint(s)
- Strength?
- Coordination?
- Flexibility?
- Response to factor

The activity should match
the person
(and vice versa)

Seuser et al (Germany)- computerized
assessments to assess sports and
patients.

Physiotherapy can also do this.....

Physiotherapy can:

- Assess joint health, strength, coordination, flexibility, *etc*
- Assess the requirements of the sport
- Find solutions to any mis-matches:
 - Exercises
 - Protective gear
 - Modify the sport
 - Work with the coach

Weight-bearing or not?

Weight-bearing:

- Stress on stressed cartilage may speed up damage
- But will → stronger bones

Non-weight-bearing:

- Less stress on cartilage
- Very important after bleeds
- But → weaker bones
 - Osteoporosis is common in PWH

References

Wallny et al. Osteoporosis in haemophilia - an underestimated comorbidity? Haemophilia 2007

Kovacs CS. Hemophilia, low bone mass, and osteopenia/osteoporosis. Transfus Apher Sci 2008

Overweight and Obesity

- Common throughout the world
- Almost 60% of the adult population in Australia is overweight or obese
- Increasing quickly in children too:
 - 25% of Australian children are currently overweight or obese
 - one of the highest rates amongst developed nations

osteoarthritis.about.com

Obesity is linked to many health problems –

- osteoarthritis is just one of them
- overweight/obesity directly affects weight-bearing joints, especially the knees
- knee osteoarthritis is *4 to 5 times* more common in overweight people than in people who are of normal body weight (and that is without hemophilia)

osteoarthritis

- During walking, a force of 3 to 6 times a person's body weight is exerted across the knee joint
 - being 10 pounds overweight increases the force on the knee by 30 to 60 pounds with each step taken....
- What if the joint is already damaged by blood?

Take home message

- Maintain a healthy body weight
 - *Protect your joints*

Using factor wisely

- Is it really a bleed?
- Is there a pattern?

Is it really a bleed?

Stephensen et al- UK
MSK Congress in Stresa, 2007

45 patients with acute 'spontaneous' joint
pain and stiffness- assessed with
Ultrasound

- Acute joint bleed 31%
- Muscle bleeding 18%
- Subcutaneous tissues 15.6%
- Synovitis diagnosed in 22%

Is it really a bleed?

- 11% pathology unrelated to hemophilia
- ***No evidence of bleeding in 33%***
- If in doubt, treat?
- Maybe not:
 - Pain from arthritis will not respond to factor
 - The challenge: Improve our assessment skills: patients AND treaters

Is there a pattern?

- Does one joint bleed more than others?
- Do bleeds occur after particular activities?
- Is there synovitis or early degeneration?

- Bleeding logs!
- Annual assessment!

- Maybe something needs to change.....

Take home message

- Complete bleeding logs regularly
- Attend your annual assessments
- Allows EARLY recognition and intervention for small problems
- Opportunity for reviewing prevention, assessment, treatment

Cure is a long way off

- In the meantime:
 - Use prophylaxis appropriately
 - Choose activities wisely
 - Treat all bleeds completely
 - Make sure it's really a bleed
 - Maintain a healthy body weight
 - Don't let little problems get out of control

and be glad you live in Australia

