

### ***Child Development and Psychomotor skills- Is there a safe age for riding motorcycles?***



**Gary J Browne**  
**Head, Academic Emergency Medicine**  
**Sports and Exercise Physician**  
**Children's Hospital Institute of Sports Medicine**

### **Objectives**

- Understand the principles of organised sport and apply these to off-road motorcycling
- Highlight the importance of the impact of growth and development on a child's readiness for involvement in dynamic sports such as off-road motorcycling
- Determine when it is safe for children to participate in off-road motorcycling

### ***Off-road motorcycling as a sport***

- Motocross is a complex dynamic skills based sport
- Children need to master and adapt the basic skills of the sport
- Once masters, they need to develop speed, control and style for safety
- Children need to be developmentally mature enough:
  - Aware of the surroundings; track / competitors
  - Able to make rapid and often time- critical decisions



### ***Children are not little adults***

- Growth and changing body composition
- Components of performance in young bodies:
  - Perfecting motor skills
  - Developing visual perception
  - Improving mental sharpness
- Changing chemistry (physiology)
  - Utilisation of oxygen
  - Energy use
  - Body fluids
- Psychological growth and mental sharpness



### ***Essential components for successful involvement of kids in sport***

- Young bodies pass through developmental planes
  - Sports skills are acquired in a progressive sequence
  - Skill not acquired equally or at the same rate
- Compensating and adjusting for growth spurts avoids problems
- Train kids as kids within their bodies boundaries
  - Training kids as adults does not necessarily lead to adult results and can often lead to adult injuries



### ***Johnny falls off his bike***

- 8 year old boy falls off a motor bike
- Riding alone in an unsupervised back paddock
- Decided to attempt a complicated jump
- An observer saw it all go wrong- "he panicked and gave the bike the gas instead of the brakes"
- The bike went down a 5m ditch landing on a fallen tree branch



### ***Developmental domains***

- Development is assessed in discrete domains
  - Hearing and vision
  - Gross motor
  - Fine motor
  - Speech and Language
  - Social and adaptive skills
- Programming of the domains is very specific and determined by age and genetics



### ***When is a child ready for involvement in competitive activity***

- Intimately related to when and how a child:
  - acquire the necessary skills
  - appropriate body composition
  - adaptability to physiologic stress
  - emotional confidence
- If each developmental stage is raised to the full potential the child can maximise performance in an enjoyable way



### ***Integration of motor and psychological skills***

- Sports skills involve a complex interaction between movement, sight and thought
- Early skills are the foundation upon which a child can progressively build new skills
  - should occur without being pressured or rushed
- Motor skills require the right visual processing to allow the correct movement response
- If responses are to be meaningful and effective
  - Complex brain processing
  - Mature thought patterns



### ***Impact of fitness and body composition on motorcycle sports***

- Genetics - "children get what they get"
- Good base of moderate aerobic training is adequate
  - Once puberty reached improvements in aerobic capacity and strength occur rapidly
- Flexibility- important for injury prevention
  - Decrease during puberty in boys
- Young children's body composition is such that it is harder to adapt to heat and to regulate body temperature during activity



### ***Strength training and motorcycle sports***

- Resistance training in physically active children adds little to overall sports performance- with puberty comes strength
- In motocross sports children rely on developmental maturity for performance- resistance training does not give them an edge
- The same principles apply- a child should not be pushed to perform above and beyond their current skill base-developmental level



### ***Psychological Aspects of sports involvement in children***

- Children less than 10 yoa approach competition differently to adults
- Excitement about a competitive challenge is a normal response
  - Stress involves fear of the event
- Self-esteem develop from interpretation of other's responses and by comparison of their skills with those of their peers
  - This comparison starts- age 5
- Decrease emphasis on winning and increase emphasis on fun



### **Are young children ready for off-road motorcycling**

An 8-year-old motocross rider die on a Saturday morning riding an 85cc Honda dirt bike on a motocross track

He was leading the race when he came down a hill too quickly and overshot a "tabletop" jump, hitting a plywood deflection wall suffering internal injuries

He had been riding motocross since he was 4 years old. "He was a good little rider and loved to jump and go fast." "He liked to ride with the older boys." "He was well equipped....."

[www.vitalmx.com/forums/Moto-Related,20/8-Year-Old-dies-at-Salt-Lake-City-track,524402](http://www.vitalmx.com/forums/Moto-Related,20/8-Year-Old-dies-at-Salt-Lake-City-track,524402)



### **Young children and off-road motorcycles**

- Make noticeable gains and learn more skills during the 6-9 year old age group
  - Fundamental skills progress to more transitional skills
  - Posture, balance, and running mature to more adult patterns by about ages 7 to 8
- Eyes can track and follow moving objects much better
  - Can't judge direction very well
- Memory and complex thinking patterns are limited
  - Not able to make rapid time-critical decisions



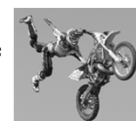
### **Psychological pressure of competing in young children**

Children rarely place high standards on themselves unless there has been considerable influence and pressure to accomplish certain goals



### **Pre-adolescence and off-road motorcycling**

- Pre-adolescent is ready to enter competitive and more difficult sports (10-12-years)
- Physically
  - Fine-tuning transitional and more complex skills
  - Bodies are ready for more intense activity
  - Improvement in visual precision
- Mentally
  - Rapid decision making improves- make complex decisions
  - Can ignore irrelevant information, focus on specific tasks
  - Emotionally still very immature



### **Kids performance and parental attitudes**

A father was heard saying at CHISM about their underperforming child -

I tell my kids before each season that once we hit the field, I'm speaking to them as their coach.....they don't expect special treatment.

My 11-year-old daughter is so well trained.....the moment we step out of the car.....she stops calling me "Dad" and calls me "Coach."

I don't understand what the problem is.....?



### **The adolescent and motorcycles**

- Early adolescence (13-15)
  - Striking developmental differences
  - Huge variations in weight and bone age
  - Growth plates vulnerable to injury
- Puberty usually arrives in girls earlier than boys- "Performance advantage"
  - "Performance advantage" is a dangerous trap to avoid for the early maturing child
- During rapid growth
  - temporary decline in balance and body control
  - the body's centre of gravity is changing and limbs become longer



### ***Adolescence and off-road motorcycles***

- RC is a 13 yo girl, a known talented motocross rider
- Riding in a paddock with friends
- Fall from trail bike
- Not wearing a helmet or gear
- Bilateral wrist #; previous accident
- Primary retrieval CHW-ED
  - Concussion
  - Leg remained pulseless after reduction requiring an urgent trip to OR



### ***Psychological aspects of performance in the adolescent***

- Have the physical & mental strength and stamina
- Over-achievement can injure an athlete:
  - earlier specialisation
  - long intense hours of training
  - excessive pressure to perform
- Impact of individual factors:
  - Perfectionism
  - High expectations
  - Peer pressure / attitude to win-at-all cost
  - Risk-taking behaviour



### ***Johnny falls off his bike***

- Found unconscious by his friend, who had the sense to call an ambulance
- He was transferred for emergency care after initial resuscitation
- Injury inventory:
  - Traumatic brain injury - later proved to be minor
  - Possible cervical spine injury
  - Penetrating chest injury- small pneumothorax
  - Large laceration to his thigh/fractures femur; with femoral artery involvement and potential for loss of limb
- Urgently taken to OR
  - Remained in PICU for 5 days
  - Continues to have rehabilitation care in hospital



### ***Simple safety precautions may have helped ?***

- Never ride alone
- Never ride in unfamiliar territory
- Never ride where bikes are not wanted
- Always do "quick inspections" of the bike before riding
- Always make sure someone knows



### ***Participation in activities involving off-road motorcycles***

- This growing activity needs to be treated like any other organised sport requiring a high degree of skill
  - Physical stamina/strength
  - Awareness and concentration- tactics/systematic moves
  - Emotional maturity
  - Experience to make time-critical decisions
- Ride in full gear: a solid helmet, mesh safety leatherjacket/pants, boots and goggles
- The parents participation is the key to safety



### ***Off-road motorcycle sports can begin in pre-adolescence***

- Pre-adolescence is a time when a child could consider involvement in off-road motorcycle sports (10-12)
- There should be a gradual progression within the sport based on the children's developmental capability and skill level
- Strict supervision is mandatory and adherence to safety standards essential



***Off-road motorcycling can be safe and fun, if treated with respect like any other sport***

- The basic principle of child growth and development are important
- Children are different and achieve maturity at different rates
- Apply the principles of a successful sport:
  - Preparation
  - Protection
  - Practice
  - Performance
  - Supervision



***Conclusion***

- Off-road motorcycling can be safe and fun if handled like any other organised sport
- Children grow and develop in a progressive manner but each child is unique and this must be considered
- Commenced at the right time with the right supervision and training to ensure children do not go beyond their true capabilities off-road motorcycling can be made safe and fun

