Health Watch Table – Fragile X Syndrome

Forster-Gibson and Berg 2011

CONSIDERATIONS	RECOMMENDATIONS
1. HEENT (HEAD, EYES, EARS, NOSE, THROAT)	
Children Vision: strabismus, refractive errors are common Hearing: recurrent otitis media is common Nose: sinusitis is common	☐ Undertake newborn vision and hearing screening and an auditory brainstem response (ABR). ☐ Refer for a comprehensive ophthalmologic examination by 4 years of age. ☐ Visualize tympanic membranes at each visit.
Adults: strabismus and refractive errors are common	☐ Undertake hearing and vision screening at each visit with particular attention to myopia and hearing loss.
2. DENTAL	
Children and Adults: High arched palate and dental malocclusion are common	☐ Refer to a dentist for an annual exam.
3. CARDIOVASCULAR	
Children: Mitral Valve Prolapse (MVP) is less common in children (~10%), but may develop during adolescence	☐ Auscultate for murmurs or clicks at each visit. If present, do an ECG and echocardiogram; refer to cardiologist, if indicated.
Adults: MVP is common (~ 80%). Aortic root dilation usually is not progressive Hypertension is common and exacerbated by anxiety	☐ Undertake an annual clinical exam. Based on findings, obtain an ECG and echocardiogram. Refer to cardiologist, as appropriate. ☐ Measure BP at each visit and at least annually. ☐ Treat hypertension when present.
4. RESPIRATORY	
Children & Adults: Obstructive sleep apnea (OSA) may be due to enlarged adenoids, hypotonia or connective tissue dysplasia	☐ Ascertain a sleep history and assess for evidence of OSA. ☐ Obtain a sleep study as appropriate.
5. GASTROINTESTINAL	
Children: In infants, feeding problems are common with recurrent emesis associated with Gastroesophageal Reflux Disease (GERD) in ~ 30% of infants	☐ Refer for assessment of GERD. Thickened liquids and upright positioning may be sufficient to manage GERD.
6. GENITOURINARY	
Children and Adults: Inguinal hernias are relatively common in males Macroorchidism generally develops in late childhood and early adolescence and persists Ureteral reflux may persist into adulthood	☐ Assess for inguinal hernia annually beginning at age 1 year. ☐ Macroorchidism can be measured with an orchidometer; reassure parents and patients that it does not require treatment. ☐ Evaluate recurring urinary tract infections (UTI) with cystourethrogram and renal ultrasound. Refer to a nephrologist or urologist as needed. ☐ Consider and assess for a renal etiology, such as scarring, as the basis for persistent hypertension.
7. SEXUAL FUNCTION	
Adults: Males and females are fertile	☐ Consider discussion of recurrence risk and reproductive options as a basis for referral to a geneticist. Make such a referral even if fragile X is only suspected so that molecular testing can be undertaken in the person concerned and relevant family members.

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8. MUSCULOSKELETAL (MSK)	
Children & Adults: Hyperextensible joints and pes planus are common. Scoliosis, clubfeet, joint dislocations (particularly congenital hip) may also occur	☐ Undertake an MSK exam at birth, then every 4 months to adulthood, then at least annually. ☐ Elicit a history of possible dislocations. ☐ Refer to an orthopedic surgeon as dictated by clinical findings. ☐ Referral to an occupational therapist (OT) in childhood is essential. ☐ Consider referring to a physiotherapist and podiatrist for orthotics.
9. NEUROLOGY	
Children & Adults: ~ 20% have epilepsy (may include generalized tonic-clonic seizures, staring spells, partial motor seizures, and temporal lobe seizures) Hypotonia is common, in addition to fine and gross motor delays Epilepsy occasionally persists into adulthood	☐ Ascertain a history of seizures, which usually present in early childhood. ☐ Assess for atypical seizures in adulthood if suspicious findings occur or if intellectual function decreases. ☐ Arrange an EEG if epilepsy is suspected from the history. ☐ Refer to a neurologist as dictated by clinical findings.
10. BEHAVIOURAL/MENTAL HEALTH	
Children: 70% - 80% are hyperactive; ~ 30% have autism Autistic-like features are common and may indicate concurrent Autism Spectrum Disorder Anxiety and mood disorders can also be present Some features of autism, tantrums and aggression as well as anxiety and mood disorders may be treated with specific pharmacological agents Sensory defensiveness is common	☐ Make an early referral to a clinical psychologist for essential parental teaching of appropriate behaviour modification techniques following diagnosis. ☐ Encourage use of antioxidants including vitamin E, vitamin C, folate and fruit juices. ☐ Hyperactivity may be managed using stimulant medications after age 5 years. ☐ Refer to an Intensive Behavioural Intervention (IBI) Autism treatment program if Autism Spectrum Disorder is present. ☐ Consider a referral to a psychiatrist for possible mental health disorders. ☐ Refer to a speech and language therapist following diagnosis. ☐ Refer to an occupational therapist (OT) for a sensory diet and sensory integration program.
Adults: Aggressive behaviour, sensory defensiveness, Attention Deficit Hyperactivity Disorder (ADHD), mood instability, and anxiety are common in adolescence and adulthood	☐ Consider referral to a psychiatrist or psychologist to assess and manage possible mental health disorders. ☐ Violent outbursts are frequent, especially in males, and may respond to behavioural and/or pharmacological measures (as for children).
11. ENDOCRINE	
Children: Precocious puberty may occur	☐ Include attention in clinical examination to signs of precocious puberty in females. Refer to an endocrinologist for consideration of use of a gonadotropin agonist to manage precocious puberty.
Adults: Premenstrual symptoms (PMS) may be severe	☐ Ascertain history of PMS with attention to menstruation, anxiety, depression, and mood lability. Consider an SSRI to stabilize mood if PMS symptoms are severe enough.
12. OTHER	
Occasionally presents as Prader-Willi syndrome-like phenotype	☐ For management of obesity and hyperphagia, consider approaches recommended for persons with Prader-Willi syndrome. ☐ Refer to appropriate specialists (e.g., neurologist, endocrinologist, psychiatrist) as indicated to assist in managing Prader-Willi syndrome-

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PREMUTATION CARRIERS: A late onset tremor/ataxia syndrome has been reported in ~ 40 – 50% of male and ~ 8% of female fragile X permutation carriers Premature ovarian failure by age 45 has been reported in ~ 20 – 40% of female fragile X premutation carriers Psychiatric problems (e.g., mood and anxiety disorders) seem likely to occur in both male and female fragile X permutation carriers [1, 2]	like symptoms. ☐ If premutation is suspected but not yet identified, order fragile X DNA testing or refer to a genetics clinic. ☐ To manage depression or anxiety in premutation carriers, SSRIs, regular exercise and counseling have been helpful.

WEBSITES THAT MAY BE HELPFUL FOR FAMILIES AND CAREGIVERS	
FRAXA Research Foundation	☐ www.fraxa.org
Fragile X Research Foundation of Canada	☐ www.fragile-x.ca/default2.htm
The National Fragile X Foundation	☐ www.fragilex.org/html/home.shtml

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