Intro:
We report the administration of intramuscular dexmedetomidine and midazolam for the management of the anxious, uncooperative, and cognitively delayed adolescents. All of the patients refused oral midazolam and they were not ideal candidates for intramuscular ketamine. Based on our successful experience with one autistic adolescent, we used this combination of medications via this route of administration on 3 other separate occasions.

Cases:

Patient 1 – 14 year old, 46 kg boy with history of autism, ADHD, and pituitary cyst presenting for head MRI.
Patient 2 – 13 year old, 47 kg boy with history of velocardiofacial (DiGeorge) syndrome, autism, and speech apraxia presenting for dental restoration.
Patient 3 – 19 year old, 50 kg girl with history of Trisomy 21, probable OSA, seizure disorder, cataracts, and retinal detachment presenting for vitrectomy, silicone oil removal of the right eye.
Patient 4 – 17 year old, 120 kg boy with autism and headaches presenting for a lumbar puncture.

Previous Anesthetics: Each of the patients had a history of significant anxiety and agitation prior to and during induction. All had refused oral premedication.

Sedation: Sedation assessed throughout with Ramsay sedation scale (1,2). Each patient received an IM injection of dexmedetomidine 2 mcg/kg and midazolam 0.1 mg/kg in the deltoid muscle using a 21g SafetyGlide Needle (BD Franklin Lakes, NJ), causing minimal distress.
Patient 1 did not require any additional sedation for the MRI. He moved briefly when an IV was inserted and fell back asleep.
Patient 2 received the IM injection in the surgery registration area after refusing to enter preoperative holding. 10 minutes later he was carried to his holding room.
Patient 3 had a calm mask induction.
Patient 4 received an IV without restraints and was calm during its placement. He did snore loudly and obstructed periodically with oxygen desaturation to 86% on room air.

Post-operatively: Initially, all patients were calm and sedated in the PACU. Some required additional but minimal sedation during recovery.

Discussion:
Intramuscular dexmedetomidine was previously described for sedation for pediatric MRI and CT. In doses of 1-4 mcg/kg, Ramsey 4 was achieved in 95% of patients 3-13 minutes after administration (3). Similar pharmacokinetic parameters were found in adults (4). Peak concentration of dexmedetomidine was achieved 12 minutes (avg) after IM injection. Wide variability occurred with the range of peak concentration varying from 2-60 minutes. Mason, et. al., saw non-dose-dependent hypotension in 14% of patients (3). Hypotension did not occur in our patients, but may be a concern in other patients.

We observed a similar onset of sedation with 2 mcg/kg of IM dexmedetomidine. The use of intramuscular dexmedetomidine combined with midazolam provided an effective and safe alternative for preoperative sedation in four developmentally delayed patients with extreme preoperative anxiety. One patient experienced oxygen desaturation during snoring with obstructive episodes. The family stated this was his baseline when he slept at home. He was referred for a sleep study.