



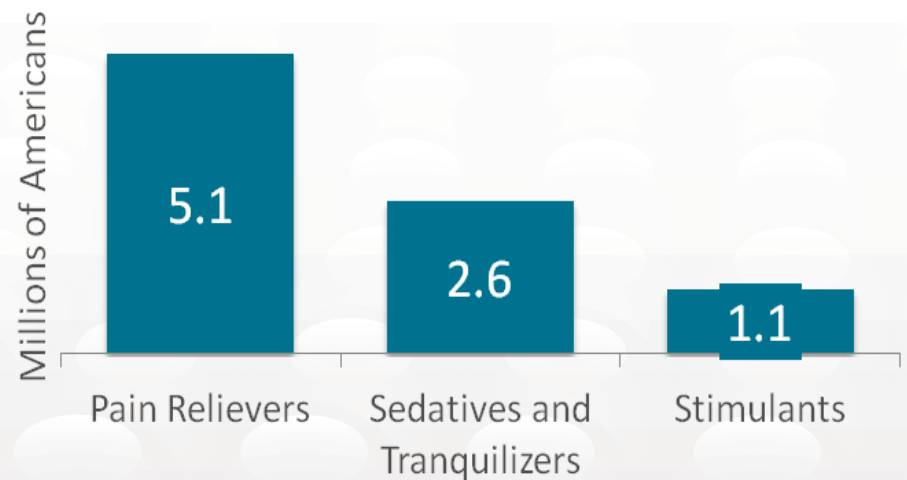
Stealth Beadlets™

Abuse-Deterrent Technology

QR_x
Pharma

Prescription Drug Abuse

- In 2011, CDC officially labeled prescription drug abuse a national epidemic
- 7 million Americans in 2010 reported prescription drug use for non-medical purposes (2.7% of the U.S. population)
- Drug overdoses increased five-fold over last decade
- Over 15,000 people in the US died from opioid overdoses last year
- Overdoses from prescription drugs now exceed those from heroin and cocaine combined



Source:
National Institute on Drug Abuse (NIDA), 2011

Source:
National Survey on Drug Use and Health (NSDUH), 2010

Drug Tampering and Abuse

- Rapid and significant drug release through common extraction methods:
 - Crushing
 - Grinding/Chewing
 - Dissolving
 - Filtration and solvent extraction
 - Needle aspiration
 - Heating
- Administration routes (abuse) of tampered drugs:
 - Oral (usually solubilized)
 - Nasal insufflation (snorting)
 - Intravenous (injecting)
 - Smoking/inhalation

Abuse-Deterrent Technologies

- Abuse-deterrent technologies have two objectives:
 - Deliver drug as intended (when taken as prescribed)
 - Provide barrier to common extraction methods
- Most tampering (abuse) begins with crushing of a solid dosage form
- Technologies which impede drug extraction via crushing are widely suitable

Types of Abuse-Deterrent Technologies

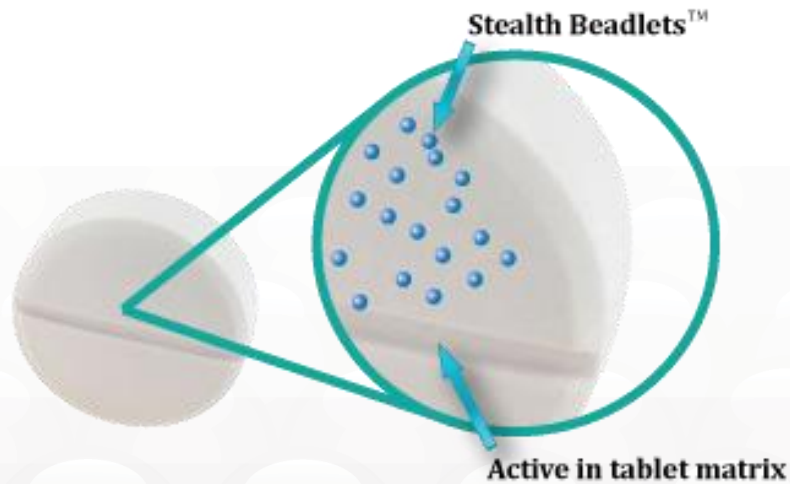
- Physical/Chemical barriers
 - Crush resistance
 - Micro encapsulation, high viscosity gel cap
 - Gelling when solubilized
- Agonist/Antagonist combinations
 - Naltrexone
- Aversion
 - Niacin
- Delivery System
 - Depot injection, implant
- Prodrug
 - Inactive until metabolized

QRxPharma's Stealth Beadlets™

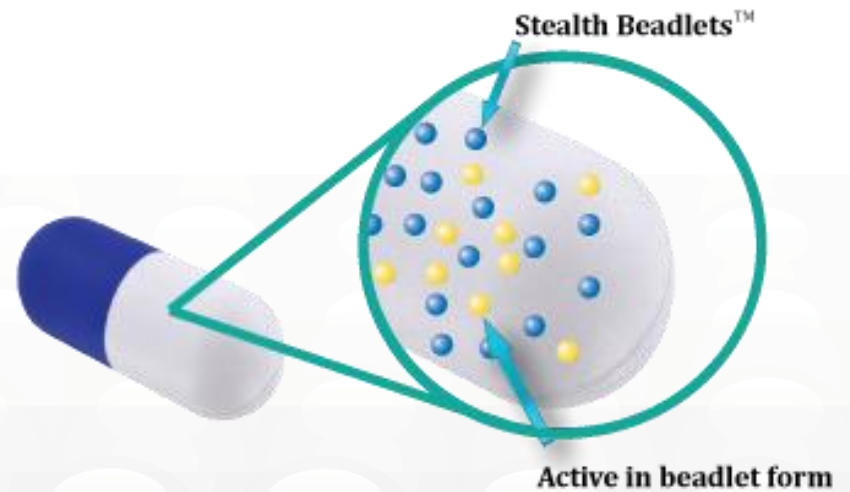
- Provides physical barrier to abuse by limiting extraction of active ingredients if crushed and then solubilized or heated
- Proprietary technology which can be incorporated into almost any solid dosage form
- Can be readily incorporated into current manufacturing process for core product as an additional excipient
- Consists entirely of patient friendly, low cost, non-novel excipients

Example Dosage Forms

Immediate Release Tablet



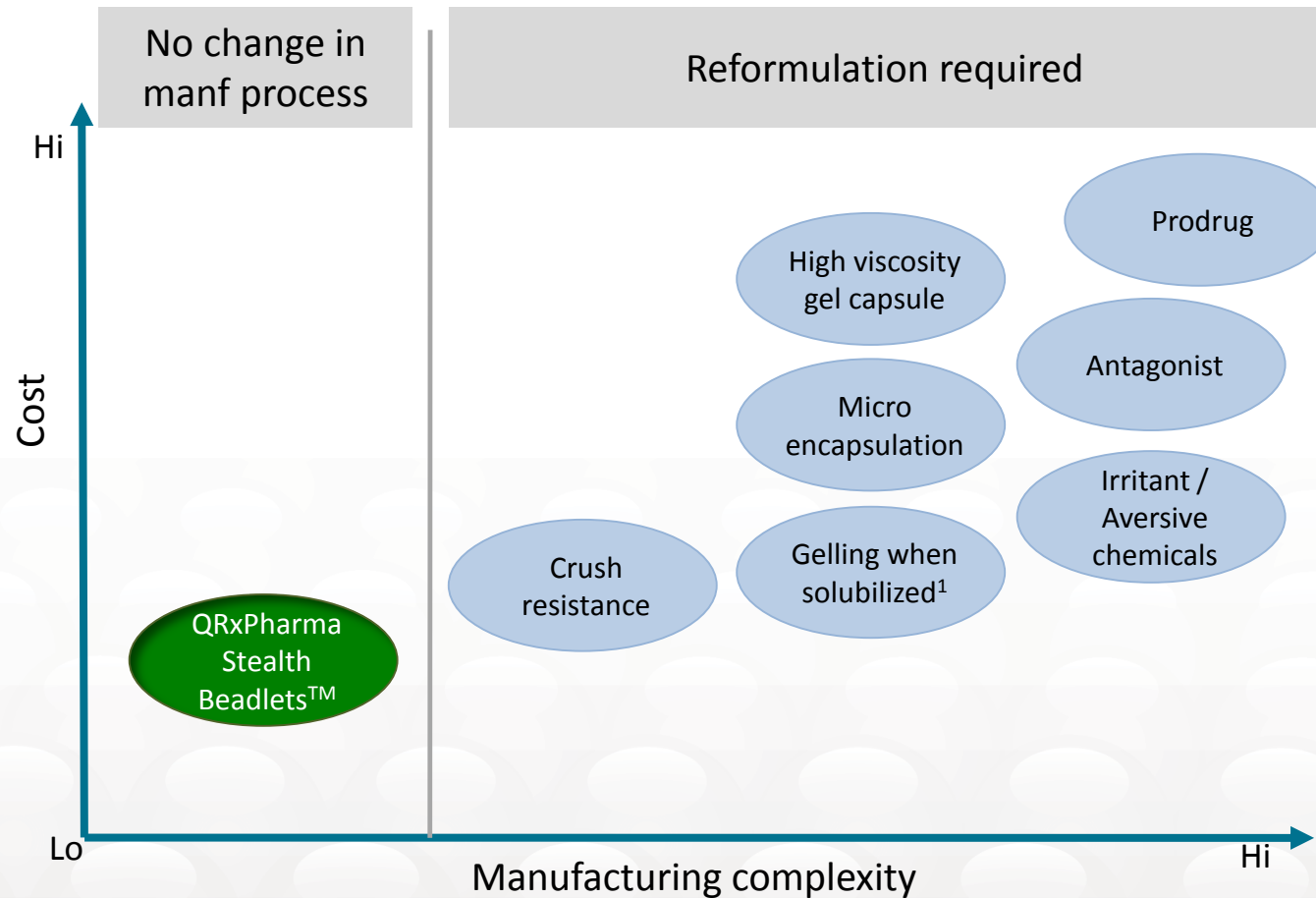
Controlled Release Capsule



Manufacturing: Ease of Integration

- No proprietary manufacturing processes involved
- Beadlets can be supplied as finished goods or produced via conventional pharmaceutical process in suitably equipped facility
- Amenable to traditional tablet compression processes and can be incorporated directly into the tablet matrix
- Excipients are readily available, non-novel and low cost
- Scalable

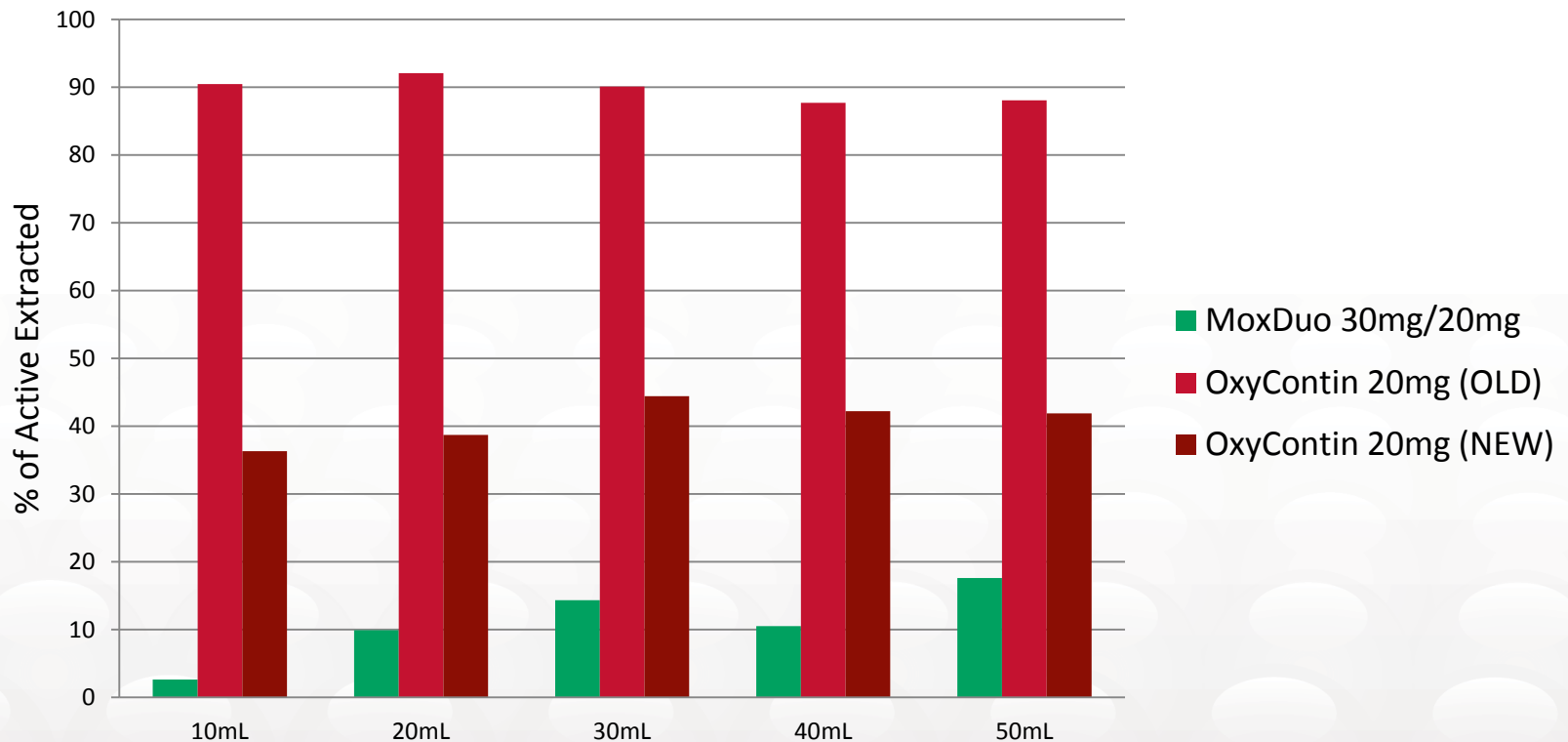
Relative Cost and Manufacturing Complexity of Abuse-Deterrent Technologies



1. All other gelling technologies except QRxPharma's Stealth Beadlets™
Note: Graphic is illustrative of relative costs and manufacturing complexity only

Extraction of Oxycodone from Crushed Tablet Using Vodka (40% alcohol) as Solvent

"Vodka" Extraction of Crushed Tablet



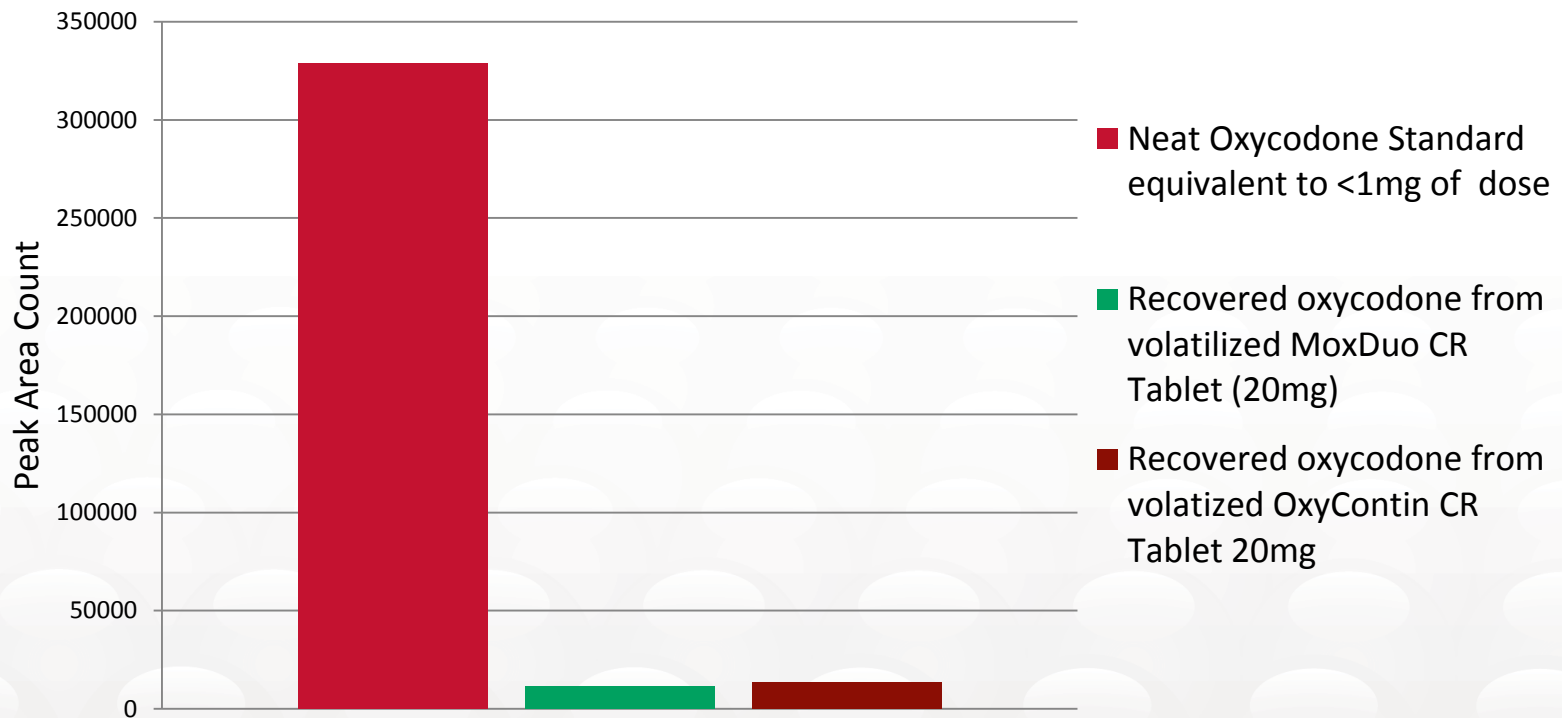
OxyContin is a registered trademark of Purdue Pharma LP.

Moxduo is a registered trademark of QRxPharma Ltd.

Moxduo® CR contains 30mg of morphine and 20mg of oxycodone. Analysis of the 20mg oxycodone component only, is shown for comparative purposes.

Degree of Volatility of Active Ingredients in the Presence of ADF

RELEASE OF API VAPOR FROM HEATED TABLETS



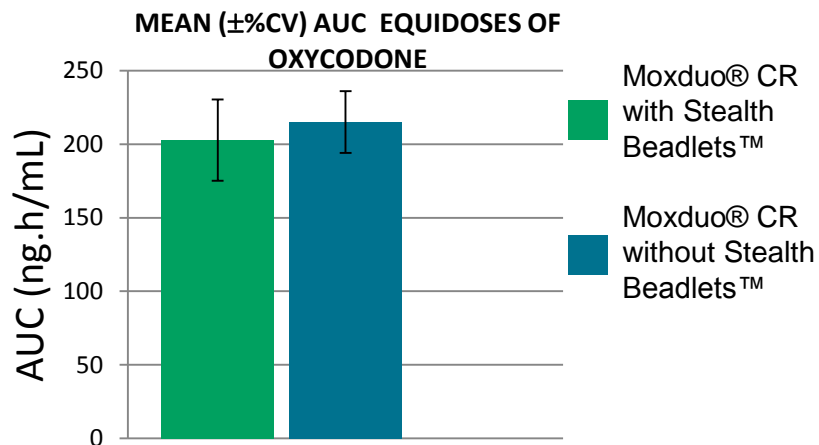
OxyContin is a registered trademark of Purdue Pharma LP.

Moxduo is a registered trademark of QRxPharma Ltd.

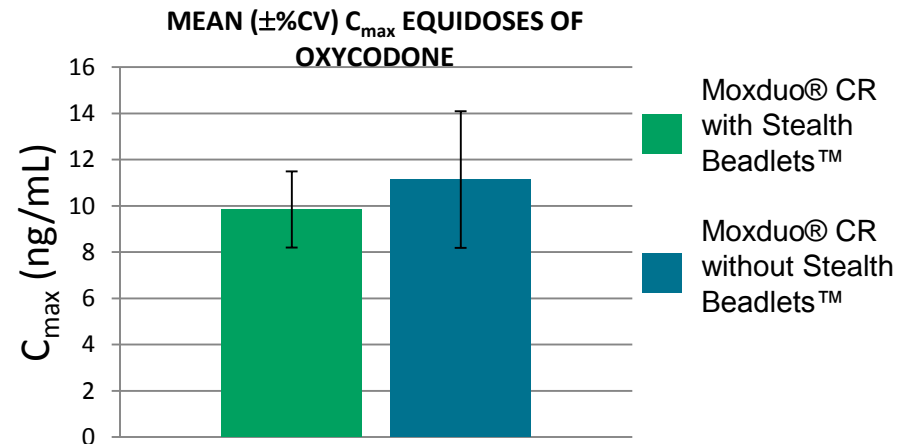
Moxduo® CR contains 30mg of morphine and 20mg of oxycodone. Analysis of the 20mg oxycodone component only, is shown for comparative purposes.

Bioequivalence with/without Stealth Beadlets

AUC OF OXYCODONE IN PHARMACOKINETIC STUDY (WITH/WITHOUT STEALTH BEADLETS™)



C_{MAX} OF OXYCODONE IN PHARMACOKINETIC STUDY (WITH/WITHOUT STEALTH BEADLETS™)



QRxPharma Stealth Beadlets™

Abuse-Deterrent Technology

Available for licensing

For more information contact:

Dr. Janette Dixon
Senior VP, Global Business Development
Email: janette.dixon@qrxpharma.com
Phone: +1 908 391 2507