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IMPROVING Medication Safety

With more than 10,000 prescription medicines available to clinicians and patients, the **Agency for Healthcare Research and Quality** (part of the **U.S. Department of Health and Human Services**) notes that prescription medicine use comes with an increased number of risks. Adverse drug events (ADE) send nearly 700,000 people to US emergency rooms each year, with approximately 100,000 cases ending in hospitalization. Dosage errors have been identified as a leading cause of ADEs, but two companies recently debuted innovative packaging to help prevent them.¹

DYNAMIC DISPENSER

Administering accurate doses of medical syrups and suspensions can be challenging, especially in pediatric applications, where the person dispensing the medication may not have two hands available to measure the correct dose. To solve this challenge, **Balda C. Brewer**, a company specializing in medical plastics injection molding and contract manufacturing, developed its **Dial-the-Dose** liquid medicine dispenser, which is capable of measuring accurate doses using just one hand. Caregivers draw the medication into the dispenser and then dial to the desired dosage volume. Doses can be administered in volumes ranging from 0.5 mL to 3.0 mL (measured in increments of 0.5 mL), with accuracy of +/- 10 percent.

Although a single Dial-the-Dose dispenser can be used numerous times for the same medication, it cannot be used with multiple medications because it cannot be disassembled. Balda notes that the device's plunger could be modified to accommodate preloaded doses of medication but would not be considered a prefilled product. Dial-the-Dose can also be customized to a specific product and has the potential of being connected with smart devices.²



PATIENT SMART

Pharmaceutical product development company **Noble International** prides itself on patient-centric innovation. The **Smart Pad 2.0** turns packaging injection pads into smart devices, incorporating sensors and additional onboard technology that detects medication-usage mistakes and provides patient training and education. The "active learning experience" is designed to help reduce patient anxiety, while also helping long-term or high-frequency patients learn important steps in the self-administration of their medication. The Smart Pad technology can be used with multiple injection devices and can be programmed with different languages.³



FOOD SAFETY in China

The **Food Safety Law of the People's Republic of China**, first outlined in 2009, is now considered to be law. Broad changes were implemented, with the goal being closer supervision and tighter controls on food production and management. Draft amendments created by the **China Food and Drug Administration (CFDA)** in response to food-related scandals that have lessened public confidence in Chinese food products were released in December 2015 to the public, providing information on how the laws will be implemented and enforced.⁴

NEW PACKAGING APPROVALS

This past June, food packaging underwent extensive review to ensure compliance with the amended Food Safety Law. Several materials were approved for use by **The National Health and Family Planning Commission (NHFPCC)**, including six new food-contact resins, 12 new packaging additives, and five expanded uses for food packaging additives. Select approved food packaging additives include: aluminum oxide; glycerides, castor-oil-mono, hydrogenated, acetates; magnesium oxide; and polyacrylamide.

The approved additives will become part of the National Standards (known as "GB Standards"), specifically the "Hygienic Standard for Use of Additives in Food Containers and Packaging Materials" (GB 9685). Resin approvals will be incorporated into the new Standard on Food-Contact Use Plastic Resins. Although the additive approvals are labeled administrative until the next amendment of standards (which generally happens every five years), they will be treated as final, legally binding approvals that will govern the referenced food-contact materials in China.⁵



MEDICAL FOOD REGULATIONS

Effective in July this year, foods formulated to deal with special medical conditions (known as Formulated Foods for Special Medicinal Purposes or FSMP) are regulated by new CFDA measures. Domestic and overseas manufacturers alike must now register with CFDA

before marketing any FSMPs; in addition, domestic manufacturers must apply for FSMP production permits. Factors that determine whether a food is considered an FSMP include how it is labeled and the claims the manufacturers make. Two classifications exist: intended for infants (0 to 12 months) and for people over the age of one. The second category is now broken down into foods with full nutrition (which can be the sole source of nutrition); special full nutrition (identical to the previous classification but for a specific medical condition); and partial nutrition FSMPs.⁶

COMBATTING Port Congestion

Congestion continues to increase at United States ports, with the **U.S. Federal Maritime Commission** citing the challenge as today's "most crucial trade-related issue." New industry-specific apps have been designed to address the issue and are currently being used at the seventh largest port in the United States: Oakland, California.⁷

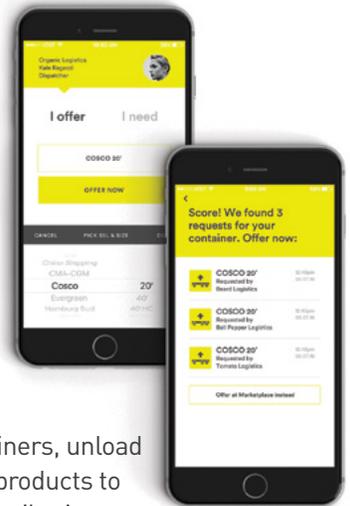
IMPROVING PORT PRODUCTIVITY

Developed and powered by **Leidos**—an American engineering company that specializes in science and technology solutions for national security, health, and infrastructure—two new smartphone apps, **DrayQ** and **DrayLink**, are expected to transform how containerized cargo is managed at seaports. DrayQ provides real-time estimates of drayage truck turnaround times at ports and terminal yards, while DrayLink allows all key stakeholders (from drivers to dispatch companies and freight forwarders) to dispatch, track, and record container movement from pickup to delivery.⁸ Shippers can monitor the locations of their trucks and track productivity and determine if dispatching needs improvement; ports can monitor efficiency, with precise data clearly showing how well they are doing. The apps were commissioned for development by the Port of Oakland and use GPS, WiFi, and Bluetooth technologies to collect data in and around ports and terminals.⁹



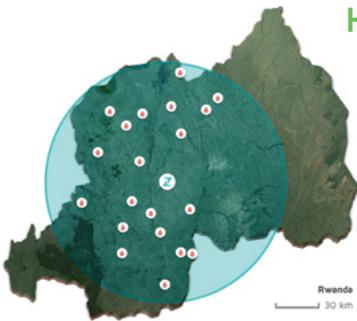
MOBILE MASTERMIND

Designed with a trucker's perspective in mind, the **Jupigo** smartphone app was created by Oakland harbor driver **Filex Fok** to help harbor truckers exchange empty cargo containers without ever entering the port. Fok's objective? To keep truckers on the road instead of waiting at busy terminal gates. In a typical scenario after a ship docks, drivers need to locate correct containers, unload their cargo, and then transport the products to the appropriate warehouses and distribution centers. Congestion becomes commonplace as truckers wait to collect containers, and if the right container isn't easily found, additional congestion and delays are created. Jupigo takes the transaction outside the port itself, helping drivers locate the shipping containers they need so drivers can swap them without needing to physically enter the port. In short, the app matches drivers who have empty containers to return with drivers who need the same type of containers, saving hours of drive and wait time.¹⁰



DRONE APPLICATIONS Continue to Soar

Over the next 10 years, drones are expected to improve warehouse efficiency in three ways: inventory management, claims and returns, and store-to-customer delivery. Big-name retailers, including **Walmart**, are experimenting with warehouse drones, and a unique drone partnership is already making charitable medical deliveries a reality.¹¹



HEALTHCARE HELPER

Northern California drone manufacturer **Zipline International** has partnered with **The UPS Alliance** (the charitable arm of the package delivery giant) and the **Gavi Vaccine Alliance** (a public-private global health partnership that distributes

vaccines) to supply lightweight, fixed-wing drones as delivery vehicles for blood, and eventually rabies vaccines, to remote-area health clinics in Rwanda. Each Zipline drone can house a small paperboard box filled with lifesaving medical supplies in its belly, along with a parachute. The drones are able to fly long distances over Rwanda's washed-out roads, making them a faster, more reliable form of delivery than motorcycles and trucks while being no more expensive. Beginning in July, health workers at 20 hospitals and health centers in Rwanda can order blood via a text message sent to Zipline's hub, with deliveries occurring within just 30 minutes. UPS states that although the partnership is a humanitarian effort on its end, the company also expects to gain valuable information from the program.¹²



WALMART'S WAREHOUSES

Retail powerhouse Walmart is testing drones to improve inventory management at its largest warehouses, an indication of the company's continued efforts to grow and compete more effectively against its low-cost retail rival **Amazon**. The company anticipates that its distribution centers may start using drones in the next few months, as the machines' ability to check inventory in a day or less provides a dramatic advantage when compared to the monthlong effort that the current manual (employee-led) process takes. Inventory checks involve drones flying around the distribution center in methodical, vertical movements while capturing 30 pictures per second and flagging misplaced items. Images are monitored in a control tower, with alerts sent to workers to address flagged items when they are identified.^{13,14}

MULTISENSORY Connection

As the challenge of attracting new customers grows increasingly difficult each year, marketers are exploring alternative methods beyond visual and auditory advertising cues, including engaging new senses (like taste and smell) as part of the marketing mix. Restaurants are also embracing this trend with unique, multisensory dining experiences.



CONTEXTUAL CAMPAIGN

Hoping to connect with consumers in the right environment, Danish brewer **Carlsberg Group** is investing in experiential tactics where consumers will be most receptive. In its most recent marketing campaign for its **Carlsberg Beer** brand, the company stated that it had to “embrace different technologies” to stand out in a challenging operating environment. In support of its revived positioning as “probably the best beer in the world,” the company executed an experiential beer poster with the tagline “probably the best poster in the world” that dispensed a free half pint of beer to consumers. The company then built on the success of the beer poster with a holiday campaign featuring a Carlsberg Christmas tree fitted with candlelit beer bottles, digital lighting, and a large beer hop. The first 100 visitors to the tree received a custom, handblown glass Carlsberg “beerble,” a perfectly sized glass bauble to consume a sample of Carlsberg.¹⁶

FOOD SCIENCE

A professor of experimental psychology at the **University of Oxford**, **Charles Spence**, is seeking funding for a combination multisensory restaurant and research lab, most likely to be located in London. In his role at **Kitchen Theory**, a gastronomy experience design lab founded by **Chef Jozef Youssef**, Spence creates multisensory menus, workshops, and seminars. He is working on his theory of sonic seasonings, where flavors and sounds are matched to optimize tastes of foods.

For example, Spence discovered that sweet and sour foods are enhanced by high-pitched music, whereas bitter flavors taste better when accompanied by low-pitched sounds. **British Airways** is applying his research on long-haul flights, where passengers can order food and wine and then choose musical pairings from the airline’s entertainment system.¹⁷ To further his research, Spence and Kitchen Theory are also offering a limited number of dining experiences to consumers through the end of 2016 at London’s **Andaz Liverpool Street Hotel**, where he hopes to “experiment” with guests and collect feedback.¹⁸



GALVANIZING GLASS

Recycling Efforts

Although glass containers for beverages and food are 100 percent recyclable, glass recycling must be effectively planned and properly executed to truly make an impact. In some ways momentum is reversing, with several cities removing glass recycling from their programs and sending the waste to landfills despite the fact that demand for recycled glass dramatically exceeds available supply. To address this, stakeholders across the industry are joining forces to improve glass recycling rates.¹⁹



MULTIPRONGED APPROACH

American beverage company **Dr Pepper Snapple Group (DPS)** announced plans to achieve a 60 percent recycling rate in the United States by 2030, working with partners across the government, industry, and community to help accomplish its goal. To further this goal, DPS is investing in the **Closed**

Loop Fund, contributing \$5 million over

the next 10 years to improve postconsumer recycling by funding its infrastructure. The company also renewed its relationship with **Keep America Beautiful**, committing \$1 million over three years to place recycling bins in parks. Through the Keep America Beautiful program, DPS has funded more than 2,500 recycling bins to assist recycling efforts when people are away from home. Over the next three years, DPS plans to add 4,000 recycling bins (including bins for glass) at beaches, athletic fields, walking trails, parks, and more, helping curb the biggest obstacle to consumer recycling: making it convenient.²⁰

INDUSTRY-WIDE EFFORT

Led by the **Glass Packaging Institute (GPI)**, **Diageo**, and **New Belgium Brewing** company, more than a dozen organizations have formed the **U.S. Glass Recycling Coalition** to “make glass recycling work in the U.S.” A collaboration that crosses the entire glass supply chain—from manufacturers to consumer brands, waste haulers and recycling companies to relevant trade organizations—the coalition is the first ever industry-wide effort against a common goal: creating an efficient, viable ecosystem for everyone involved. First steps involve exploring the application of global best practices to the US glass recycling supply chain, including a strategy to increase the availability of cullet (furnace-ready recycled glass) for conversion into new bottles, jars, and fiberglass. The coalition also plans to work with interested cities to help them with glass recycling decisions and to create a network of resources and advocates for glass recycling.²¹



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