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ICD-10 and its Impact on a Large
Multi-Hospital Radiology Practice
After 1 year and 673,600 Claims



Authors and Disclosures

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Nothing to Disclose

Definition: ICD

- International Classification of Diseases
 - Maintained by the World Health Organization
 - Revised on an ad hoc basis
 - ICD-10 implemented in 1994
 - United States adopted it on October 1, 2015
 - ICD-11 scheduled for implementation in 2018
 - Describes WHY a service was rendered
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Potentially Staggering Implementation Costs

	Typical Small Practice	Typical Medium Practice	Typical Large Practice
Training	\$2,700-\$3,000	\$4,800-\$7,900	\$75,100
Assessment	\$4,300-\$7,000	\$6,535-\$9,600	\$19,320
Vendor/Software Upgrades	\$0-\$60,000	\$0-\$200,000	\$0-\$2,000,000
Process Remediation	\$3,312-\$6,701	\$6,211-\$12,990	\$14,874-\$31,821
Testing	\$15,248-\$28,805	\$47,906-\$93,098	\$428,740-\$880,660
Productivity Loss	\$8,500-\$20,250	\$72,649-\$166,649	\$726,487-\$1,666,487
Payment Disruption	\$22,579-\$100,349	\$75,263-\$334,498	\$752,630-\$3,344,976
Total Costs	\$56,639-\$226,105	\$213,364-\$824,735	\$2,017,151-\$8,018,364

Typical small practice = 3 physicians, medium practice = 10 providers, large practice = 100 providers.

Projected costs of ICD-10 transition for even small physician practices were huge!

Differences between ICD-9 and ICD-10

- Number of codes
 - ICD-9-CM: 14,025
 - ICD-10-CM: 69,823
 - Number of digits
 - ICD-9-CM: Up to 5
 - ICD-10-CM: Up to 7
 - Types of digits
 - ICD-9-CM: Numeric
 - ICD-10-CM: Alphanumeric
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For Example...Ankle Sprain

- ICD-9
 - 845.00 sprains and strains of ankle, unspecified site
 - ICD-10
 - S93.4- Sprain of ankle
 - S93.401- Sprain of unspecified ligament of right ankle
 - S93.402- Sprain of unspecified ligament of left ankle
 - S93.409- Sprain of unspecified ligament of unspecified ankle
 - Required 7th digit to identify the encounter:
 - A – Initial (i.e., for the event)
 - D – Subsequent (i.e., in follow up to the initial event)
 - S – Sequela (e.g., complications or ensuing conditions)
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For example...Metatarsal Fracture

1 code in ICD-9, but 33 codes in ICD-10

825.25	FX METATARSAL-CLOSED	S92.301A	Fracture of unspecified metatarsal bone(s), right foot, initial encounter for closed fracture
		S92.302A	Fracture of unspecified metatarsal bone(s), left foot, initial encounter for closed fracture
		S92.309A	Fracture of unspecified metatarsal bone(s), unspecified foot, initial encounter for closed fracture
		S92.311A	Displaced fracture of first metatarsal bone, right foot, initial encounter for closed fracture
		S92.312A	Displaced fracture of first metatarsal bone, left foot, initial encounter for closed fracture
		S92.313A	Displaced fracture of first metatarsal bone, unspecified foot, initial encounter for closed fracture
		S92.314A	Nondisplaced fracture of first metatarsal bone, right foot, initial encounter for closed fracture
		S92.315A	Nondisplaced fracture of first metatarsal bone, left foot, initial encounter for closed fracture
		S92.316A	Nondisplaced fracture of first metatarsal bone, unspecified foot, initial encounter for closed fracture
		S92.321A	Displaced fracture of second metatarsal bone, right foot, initial encounter for closed fracture
		S92.322A	Displaced fracture of second metatarsal bone, left foot, initial encounter for closed fracture
		S92.323A	Displaced fracture of second metatarsal bone, unspecified foot, initial encounter for closed fracture
		S92.324A	Nondisplaced fracture of second metatarsal bone, right foot, initial encounter for closed fracture
		S92.325A	Nondisplaced fracture of second metatarsal bone, left foot, initial encounter for closed fracture
		S92.326A	Nondisplaced fracture of second metatarsal bone, unspecified foot, initial encounter for closed fracture
		S92.331A	Displaced fracture of third metatarsal bone, right foot, initial encounter for closed fracture
		S92.332A	Displaced fracture of third metatarsal bone, left foot, initial encounter for closed fracture
		S92.333A	Displaced fracture of third metatarsal bone, unspecified foot, initial encounter for closed fracture
		S92.334A	Nondisplaced fracture of third metatarsal bone, right foot, initial encounter for closed fracture
		S92.335A	Nondisplaced fracture of third metatarsal bone, left foot, initial encounter for closed fracture
		S92.336A	Nondisplaced fracture of third metatarsal bone, unspecified foot, initial encounter for closed fracture
		S92.341A	Displaced fracture of fourth metatarsal bone, right foot, initial encounter for closed fracture
		S92.342A	Displaced fracture of fourth metatarsal bone, left foot, initial encounter for closed fracture
		S92.343A	Displaced fracture of fourth metatarsal bone, unspecified foot, initial encounter for closed fracture
		S92.344A	Nondisplaced fracture of fourth metatarsal bone, right foot, initial encounter for closed fracture
		S92.345A	Nondisplaced fracture of fourth metatarsal bone, left foot, initial encounter for closed fracture
		S92.346A	Nondisplaced fracture of fourth metatarsal bone, unspecified foot, initial encounter for closed fracture
		S92.351A	Displaced fracture of fifth metatarsal bone, right foot, initial encounter for closed fracture
		S92.352A	Displaced fracture of fifth metatarsal bone, left foot, initial encounter for closed fracture
		S92.353A	Displaced fracture of fifth metatarsal bone, unspecified foot, initial encounter for closed fracture
		S92.354A	Nondisplaced fracture of fifth metatarsal bone, right foot, initial encounter for closed fracture
		S92.355A	Nondisplaced fracture of fifth metatarsal bone, left foot, initial encounter for closed fracture
		S92.356A	Nondisplaced fracture of fifth metatarsal bone, unspecified foot, initial encounter for closed fracture

Emory's Preparation and Predictions

- Using ICD-9 codes for the entirety of 2014 and previously described methodology, we calculated code conversion impact factors
- Code Conversion Impact Factor = number of applicable ICD-10 codes ÷ number of applicable ICD-9 codes.

Division	Total Number of Claims	ICD-9 Codes Accounting for 90% of Claims	ICD-10 Codes	Code Conversion Impact Factor
Abdominal	92,857	212	607	2.9
Breast	65,098	11	12	1.1
Cardiothoracic	96,713	76	200	2.6
Community	129,540	254	1,471	5.8
Emergency	87,754	137	1,036	7.6
Interventional	25,667	205	810	4.0
Musculoskeletal	30,659	146	4,199	28.8
Neuroradiology	44,533	230	756	3.3
Nuclear Medicine	15,702	147	389	2.6
Department Overall	588,523	348	2,048	5.9

Table 2. Total number of service claims by academic division and department over 12 months, with numbers of ICD-9 and ICD-10 codes accounting for 90% of each group of claims, along with estimated ICD-10 code conversion impact factor.

Our Predictions Prior to the Transition

- Certain academic divisions (e.g. musculoskeletal division) would be impacted greater than others (e.g. breast imaging)

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We Focused on Areas of High Exposure

- Single ICD-9 codes translating to greater than 50 ICD-10 codes
- Many of these codes (10 out of 13) are related to the musculoskeletal system

Rank Order	ICD-9 Diagnosis Code	Long Code Descriptor	Number of ICD-10 codes
1	V54.16	Aftercare for healing traumatic fracture of lower leg	1,668
2	V54.13	Aftercare for healing traumatic fracture of hip	552
3	714.0	Rheumatoid arthritis	190
4	733.99	Other disorders of bone and cartilage	180
5	959.3	Elbow, forearm, and wrist injury	179
6	727.89	Other disorders of synovium, tendon, and bursa	133
7	959.4	Hand, except finger injury	95
8	959.7	Knee, leg, ankle, and foot injury	84
9	646.83	Other specified complications of pregnancy, antepartum condition or complication	68
10	998.11	Hemorrhage complicating a procedure	58
11	998.12	Hematoma complicating a procedure	58
12	823.00	Closed fracture of upper end of tibia alone	54
13	826.0	Closed fracture of one or more phalanges of foot	51

Table 3. Top ICD-9 codes, based on 588,523 radiology claims over a 12 month period, that map to more than 50 ICD-10 codes. All but 3 apply to diseases of the musculoskeletal system.

Results: How were our Predictions?

- Applying the same methodology, we evaluated the top 90% of ICD diagnoses for the first twelve months after the ICD-10 transition
- Code conversion impact factors were calculated and compared to our predictions

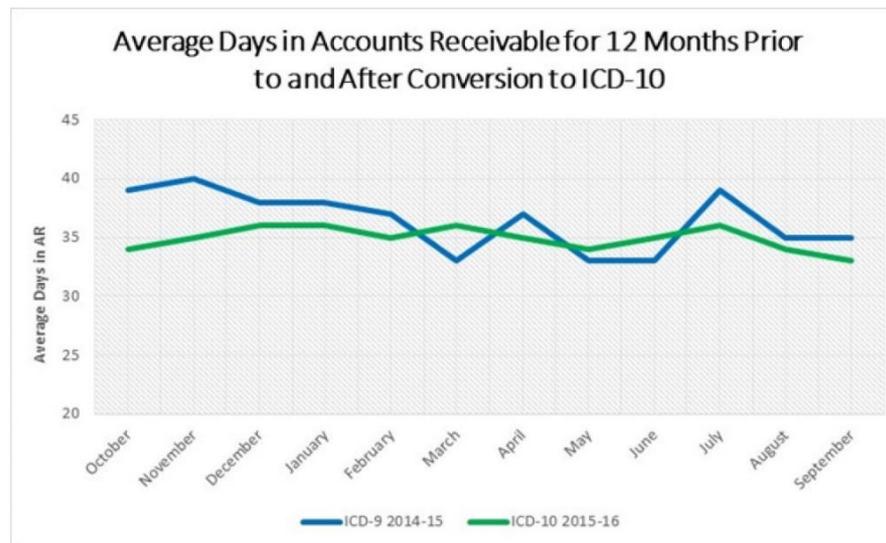
Subspecialty Division	Number of ICD-9 codes for top 90th (Actual)	Number of ICD-10 codes for top 90th (Predicted)	Number of ICD- 10 codes for top 90th (Actual)	Code-Conversion Impact Factor (Predicted)	Code-Conversion Impact Factor (Actual)	Magnitude of Overestimation
Abdominal	212	607	325	2.9	1.5	193.3%
Breast	11	12	8	1.1	0.7	157.1%
Cardiothoracic	76	200	119	2.6	1.6	162.5%
Community	254	1417	497	5.8	2.0	290.0%
Emergency	137	1036	244	7.6	1.8	422.2%
Interventional	205	810	416	4.0	2.0	200.0%
Musculoskeletal	146	4199	513	28.8	3.5	822.9%
Neuroradiology	230	756	432	3.3	1.9	173.7%
Nuclear Medicine	147	389	240	2.6	1.6	162.5%
Department Overall	348	2048	562	5.9	1.6	368.8%

Results

- 562 codes comprised the top 90% of all claims for the twelve months after ICD-10 transition
 - By comparison, 348 ICD-9 codes accounted for the top 90% of all claims in 2014
 - Code conversion impact factor of 1.6 for the department as a whole, *far less than the predicted 6-fold increase*
 - Code conversion impact for individual divisions ranged from 0.7 (breast) to 3.5 (musculoskeletal)
 - All other divisions saw impact factors in the 1.5-2.0 range
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What about claims processing?

- Compared average monthly claims days in accounts receivable (AR) status both before and after October 1, 2015
- Average monthly number of days claims in AR ranged from 33 to 40 days both before and after ICD-10 implementation
- Monthly averages for the 12 months prior to and the 12 months after ICD-10 conversion were similar (36.4 vs. 34.9, $p=0.07$)



Summary

- With active anticipator preparation, the expected financial and operational difficulties of the transition from ICD-9 to ICD-10 were not nearly as much as predicted
 - As a transition to ICD-11 looms in the future, radiology practices are advised to aggressively prepare
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