

Descriptive Statistics on Possible Bundle Definitions

Discussion Paper for the MMA §623e Advisory Board

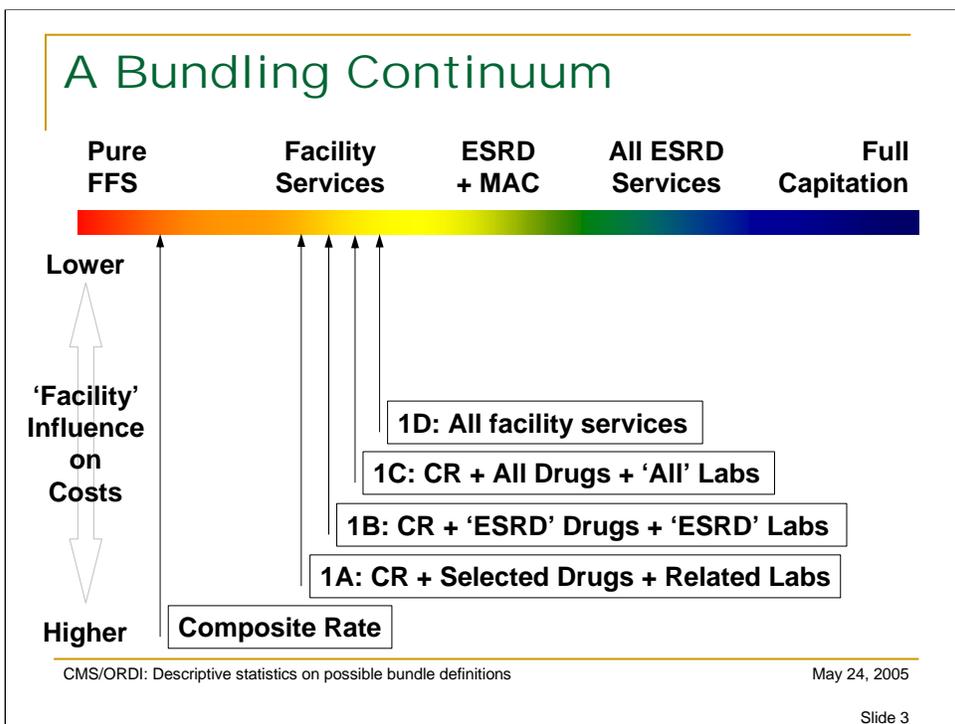
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- This document discusses the data on various bundling options. It has a number of specific goals:
 - It outlines the general framework for defining bundles—what has been referred to as a ‘bundling continuum’.
 - It discusses the nature of the data that are available for analysis of the components of different bundles.
 - It reviews what is and is not included in each proposed bundle.
 - It suggests some criteria or considerations that might influence the interpretation of the data.
 - It highlights some potential implications of the data that, it is hoped, will prompt further thought and discussion.
 - It reviews data on variation among patients in resource use that will serve as a backdrop for subsequent discussion of case mix adjustment.
- The goal is to support the advisory board fulfill its statutory charge under §623(e) to “... advise the Secretary and the Administrator of the CMS concerning the establishment and operation” of a demonstration of a “fully case mix adjusted payment system” that includes “drugs and biologicals (including erythropoietin) furnished to end stage renal disease patients ... and clinical laboratory tests related to such drugs and biologicals.”

Notice to Reader

The following discussion represents one perspective on the preliminary data on possible bundle definitions. It does not present an official position of CMS on the question of what services should be included in the bundled payment system, nor does it represent the opinions or perspectives of KECC, the CMS contractor who developed the data display in the figures and contained in the related tables.



- The services that might be included in a bundle may be placed along a continuum, although the arrangement is inevitably somewhat arbitrary. However, the general notion is to place services along the continuum based on proximity to the care that is initiated, directed, coordinated or influenced by the dialysis facility.
- Each bundle defines the services that the dialysis facility is responsible for providing directly or providing through arrangements with other providers.
- Several distinctive bundles can be identified along this continuum. Four involve 'facility' services. Two substantially expand the bundle to include certain physician payments and certain payments related to vascular access.
 - Four bundles involve services that the facility directly participates in providing:
 - Bundle 1A would include composite rate services, selected drugs provided by the facility, and selected lab tests
 - Bundle 1B adds to 1A the remaining 'major' or 'ESRD' drugs and related lab tests.
 - Bundle 1C adds to 1B all lab tests generally ordered for ESRD patients.
 - Bundle 1D adds to 1C all remaining services currently billed by dialysis facilities.

Policy Criteria/Considerations

- **Safe:** care does not injure patients
- **Effective:** only beneficial care is provided
- **Patient-centered:** patient values guide care
- **Timely:** care provided when it is needed
- **Efficient:** avoidance of waste
 - Delivery of care
 - Administrative
- **Equitable:** patient needs determine care

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- The recent 'Quality Chasm' reports from the Institute of Medicine have adopted a framework for efforts to improve the performance of the health care system. This same framework suggests criteria or policy goals against which bundling options can be evaluated.
- **Safety:** Does a bundle reduce or increase the risk of patient injury? A bundle that includes more services (e.g., laboratory tests) may reduce the risk of injury to veins. Does a bundle encourage efforts to prevent complications and co-morbidity?
- **Effective:** Does a bundle create incentives to reduce excessive treatment, i.e., use of drugs with little or no benefit for the patient? Does it unduly constrain the resources available for needed care or create incentives to skimp on care? Do payment amounts 'match' the resources needed to treat patients either individually or at the facility level?
- **Patient-centered:** Does a bundle enhance or impede the extent to which patient preferences (e.g., for modality) and values guide care? Are any incentives that may be created neutral with respect to patient preferences?
- **Timely:** Does a bundle encourage prompt response to changes in patient needs? Might it produce delays in care?
- **Efficient:** Does a bundle create incentives for facilities to improve the efficiency with which care is provided? Does it increase or decrease administrative expenses for providers, patients, or the Medicare program?
- **Equitable:** Is a bundle likely to have adverse or favorable effects on the availability of high quality care to all patients regardless of ethnicity, geographic location, or socioeconomic status?

Technical Criteria/Considerations

- Size of the bundle
- Amount and nature of variation
 - Among patients
 - Among facilities
- Implications
 - For patient selection / access
 - For provider / facility financial risk / viability
 - For case mix adjustment
 - For the unit of payment

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- The policy-related goals and criteria provide a framework within which to interpret the data. Unfortunately, none of these criteria—safety, effectiveness, patient-centeredness, timeliness, efficiency, and equity—can be translated directly into easily interpreted measures that can be constructed from available data. As a result, the following slides will focus on narrower or more technical questions.
- The pages that follow will present data on the size of the bundles and the amount and nature of variation across patient months. These data can be interpreted in a number of ways. Different people will interpret them differently. To start this process, the presentation of the data will conclude with a summary of what has been learned about variation in payments (a proxy measure for resource use) across patient months.
- The implications of this variation will be discussed under four headings: implications for patient selection (and access to care), for provider or facility financial risk and viability, for case mix adjustment, and for the selection of a unit of payment.

The Nature of the Data

- Data sources
 - Medicare enrollment files
 - Medicare claims files
 - Social Security Administration files (limited use)
- Characteristics of billing / claims data
 - Billing generates monthly data
 - Per session data calculated from bills
- Aggregation
 - Detailed billing data into categories of service
 - Multiple bills into patient-month records

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- The data used to prepare the tables that accompany this commentary are taken from the standard Medicare claims and enrollment files. The enrollment files provide information on patient characteristics. The claims files provide information on services used and amount of Medicare 'payment' (i.e., Medicare allowable charges/costs). These data may be supplemented for certain analysis with data drawn from Social Security Administration files. However, all data on payments or 'costs' are derived from Medicare claims files.
- Claims or billing data have several characteristics that should be borne in mind. Most providers/suppliers submit claims to Medicare on a monthly cycle. The monthly claim reflects all services provided to the patient and billed to Medicare during that month.
- These data can be expressed on either a 'per month' or 'per session' basis. Per session statistics are calculated from monthly data simply by dividing the number of dialysis sessions billed for the month into the total payments for composite rate services, drugs, laboratory tests, or other services. It is important to note, however, that data on per session payments are not based on a true session-level record. They are simply a transformation of monthly data.

Caveats on the Data

- Represent patterns in 2003
 - Do not reflect new payment policies
 - Do not reflect behavioral response to new policy
 - Do not reflect implementation of Part D
- Implications for distinct uses of data
 - Evaluation of possible bundles
 - Assessment of payment 'models'
 - Development of case mix adjustment method
 - Calibration of payment model
- These are the data that are available

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- The data that are available for this analysis have several limitations with varying implications for how the data are interpreted.
- The data represent billing and payment patterns in 2003.
 - Payment amounts do not reflect the new payment policies for 2005. These changes will undoubtedly affect absolute dollar amounts. However, they are likely to have a limited impact on patterns across patient characteristics and even (to a more limited degree) facility characteristics.
 - A potentially more serious problem is that the data do not reflect changes in behavior in response to new policies. Until more recent data become available it will be impossible to evaluate rigorously and quantitatively the impact of behavior changes. The interpretation of these 2003 results should be tempered by a critical awareness of the kinds of responses that changes in policy may be causing.
 - A third limitation is related to the potential effect of prescription drug coverage under Part D in 2006. It is even more difficult to precisely anticipate how Part D will affect the patterns shown in the associated tables and charts. However, an important question to keep asking is how these patterns may change—and why—in response to Medicare prescription drug coverage.
- Having noted these limitations, it is also important to recognize that they have different implications for different uses of the data. The historical data are sufficient to support research into possible bundles, payment models and case mix methods, if tested against a critical understanding of how policy and provider behavior is changing.
- Finally, it should be noted that these are the data that are available and are essentially the same kind of data that CMS has had to use to develop all payment systems.

Caveat on the 50/50 Rule

- Simplistic version of the rule
 - Applies to automated multi-channel analyzer tests
 - Applies to all tests furnished on a single day
 - Permits billing only when 50% are not under CR
- Effect on available data
 - Data do not reflect use of CR laboratory tests
 - 50/50 rule understates use of non-CR tests
 - 50/50 rule goes into effect in 2005
- Effect of bundling requirement
 - Bundling generally would make 50/50 rule moot

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- In anticipation of questions about the data on laboratory tests, a word of background on the 50/50 rule may be helpful.
- The 50/50 rule applies to and affects billing for automated multi-channel chemistry (AMCC) tests. A simple statement of the basic concept behind the rule is that billing for multi-channel analyzer tests is allowed only if more than half of the AMCC tests provided on a given day are tests that are not included in the composite rate.
 - When *less* than half of the AAMC tests are included in the composite rate, then separate payment will be made for *all* AAMC tests performed on that day including those that are included in the composite rate.
 - When *more* than half of the AAMC tests are included in the composite rate, then separate payment will not be made for *any* of the AAMC tests performed on that day whether or not the individual tests are included in the composite rate.
- The 50/50 rule reduces reporting of laboratory tests in claims data. Claims data do not, generally, reflect the use of laboratory services that are already bundled into and covered under the composite rate. The application of the 50/50 rule would allow some of the 'composite rate' tests to be separately billed but it also would prevent some non-'composite rate' tests from being billed. However, the data presented in this report do not reflect the application of the 50/50 rule.
- Bundling would generally make the 50/50 rule moot, assuming the bundled laboratory tests include AAMC tests.

Caveat Concerning Case Mix

- No adjustment for case mix
 - 'Raw' data describe variation among patients
 - Suggest amount of work case mix needs to do
- Goal / purpose of case mix adjustment
 - Variation among patients is caused by 3 factors:
 - Differences in patients' needs / response to treatment
 - Differences in treatment patterns (unexplained by need)
 - Differences in provider 'efficiency'
 - Case mix adjusts for variation attributable to need
 - What accounts for remaining variation?
 - Patient-level variation vs. facility-level variation

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- Also before turning to the data a word of caution on case mix is in order. These descriptive statistics contained in the data tables and discussed in the following pages include **no** adjustment for case mix.
 - These 'raw' data describe the variation in total payments at the level of the individual patient. Different people interpret this variation differently.
 - The total variation suggests the amount of 'work' that a case mix adjustment may need to do. That is, a portion of that total variation is attributable to differences in patient needs. The open question is: how much?
- The goal or purpose of case mix is to account for variation that is attributable to patients' need for treatment. Patients' needs and response to treatment are one of three factors that create the overall amount of variation. The two other factors include differences in treatment patterns and/or effectiveness of treatment, and differences in the efficiency with which providers deliver or produce the care received by their patients.
- Case mix models attempt to identify or explain that portion of variation attributable to patient characteristics or needs. It is unreasonable, given what is known or suspected about variation in treatment patterns and provider efficiency, to expect that even the best case mix system will account for all variation among patients. But how much of the variation is it reasonable to expect case mix to explain? What accounts for the variation that a case mix measure does not explain? And should policy makers worry about it? These are difficult and important questions.
- A final caution: variation is particularly difficult to account for at the level of the individual patient. The variation shown in the associated tables describe variation at the patient level. An important question will be how well case mix measures account for variation across facilities.

The Month/Session Distinction

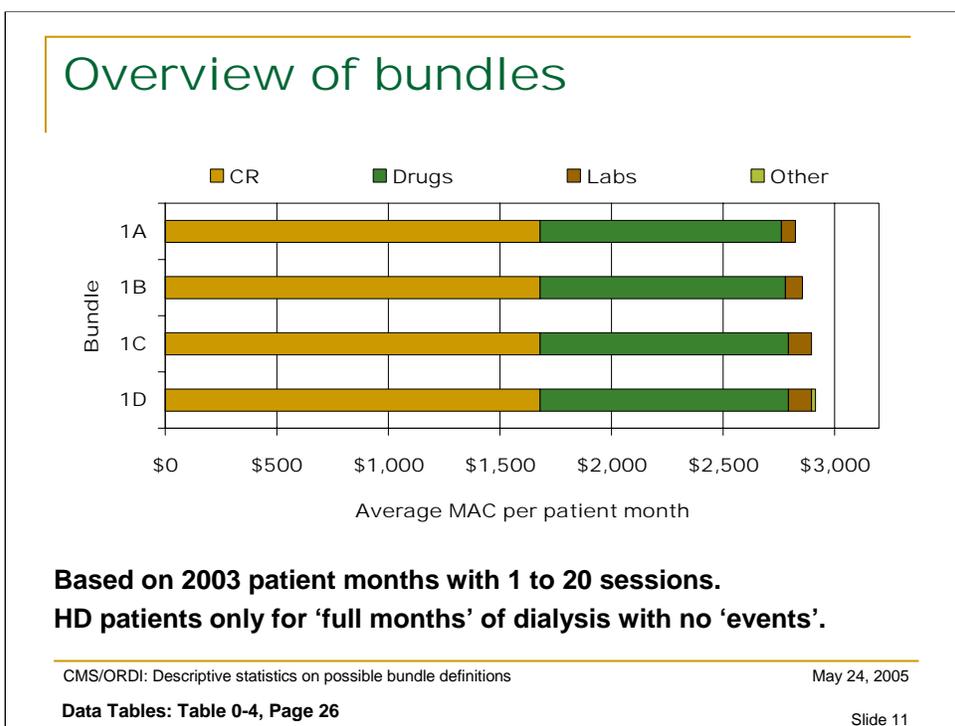
- Per month statistics
 - Arguably represent total resource needs
 - Services not used on a 'session' basis
- No presumption concerning unit of payment

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- This presentation focuses on *per month* statistics. There are two reasons for this:
 - The per month statistics provide a picture of the total resources used by a patient over a period of time. This picture may be useful as a way of thinking about the on-going treatment of chronic conditions in which care is not limited to a discrete 'episode' of illness or treatment.
 - Many services are not strongly correlated with the number of sessions provided during a month—although the number of sessions may serve as a proxy for the number of days that a patient was under the care of a facility.
- The reporting of *per month* statistics in this presentation / report should **not** be interpreted as a presumptive endorsement of—or preference for—using the month as the basic unit of payment.



- The 'bottom line' differences are an obvious starting point for a discussion of the proposed bundles. The above figure shows average Medicare payments (allowable costs/charges including patient cost-sharing) per patient month (PPM) for hemodialysis patients who received between 1 and 20 dialysis sessions in months during which a 'full month' of dialysis was provided. Months in which 'events' occurred were excluded; these events include hospitalization, transplant, transfer between facilities, change in modality, initiation of dialysis, training, and termination of dialysis because of death or other causes.
- In all bundles, composite rate payments account for \$1,682 PPM (about 58% of total payments for bundles 1A through 1D).
- Bundle 1A adds EPO, iron, and 'vitamin D' and related labs. Together these add \$1,146 PPM to the composite rate payments and account for nearly 90% of the incremental costs added under the most expansive bundle.
- Bundle 1B adds levocarnitine, alteplase, and vancomycin and related labs. These drugs and laboratory tests add \$29 PPM to the average payment under bundle 1A.
- Bundle 1C adds 7 'injectables' and most lab tests. These items and services add \$43 PPM to the average payment under bundle 1B.
- Bundle 1D adds all other services billed by dialysis facilities. Relative to bundle 1C, payments increase by \$16 PPM.
- The dollar figures used in this figure as presented on the next page.

Components of Bundles

	Average MAC (per patient month) for bundle			
	1A	1B	1C	1D
CR	\$1,682	\$1,682	\$1,682	\$1,682
Drugs	1,082	1,100	1,110	1,110
Labs	64	75	107	107
Other	—	—	—	16
Total	2,828	2,857	2,900	2,916

Based on 2003 patient months with 1 to 20 sessions.

HD patients only for 'full months' of dialysis with no 'events'.

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Data Tables: Table 0-4, Page 26

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- **In the following discussion the term 'incremental payments' refers to services that would be included in the bundle under the most expansive 'facility services' option (1D) but that are not included in the composite rate. It therefore differs slightly from the definition of 'separately billable' services under the composite rate system.**
- As shown in the previous figure and the above table, nearly all of the increase in payment from bundle 1A through bundle 1D is associated with EPO, iron and 'vitamin D'. These drugs add \$1,082 PPM to composite rate payments. The related laboratory tests thought to be related to anemia and vitamin D add \$64 PPM to composite rate payments.
- The addition of levocarnitine, alteplase, and vancomycin adds less than \$30 PPM to the payment under the bundle (relative to 1A).
- The addition of the remaining injectable drugs and laboratory tests adds \$43 to the payment under bundle (relative to 1B).
- The addition of all other facility services under bundle 1C adds only \$16 PPM to the bundle.
- **Note that these figures are based on patient months in 2003 for hemodialysis patients only who did not experience any 'events' to disrupt a 'full month' of dialysis. Components may not sum to the total due to rounding.**

Incremental Differences

	Average MAC (per patient month) for bundle			
	1A	1B	1C	1D
CR	—	—	—	—
Drugs	+1,082	+18	+11	+0
Labs	+64	+11	+32	+0
Other	—	—	—	+16
Total	+1,146	+29	+43	+16

Based on 2003 patient months with 1 to 20 sessions.

HD patients only for 'full months' of dialysis with no 'events'.

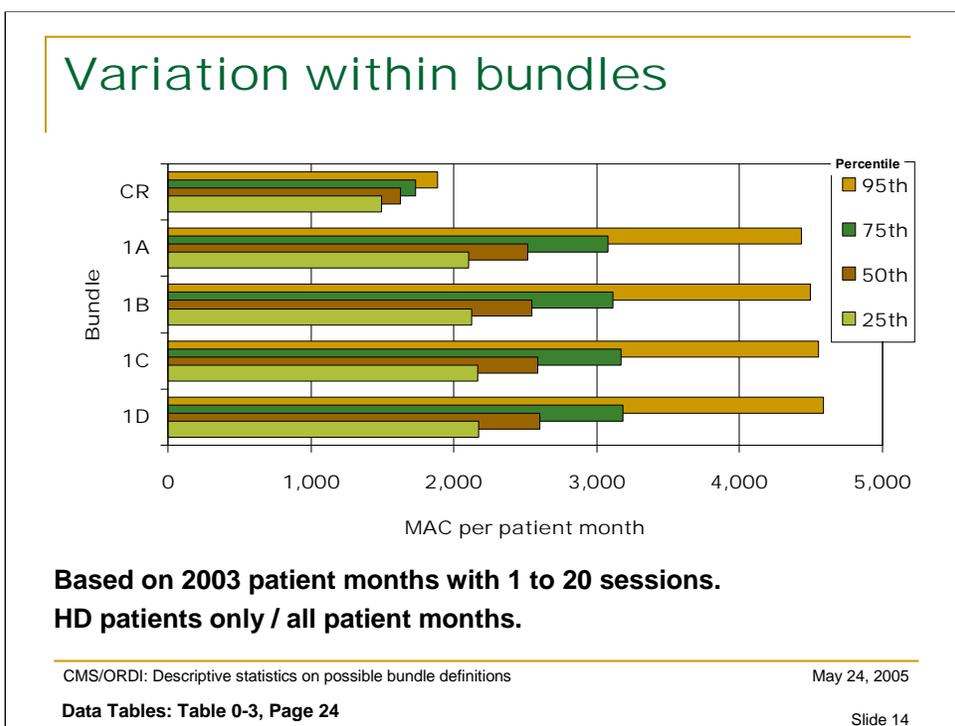
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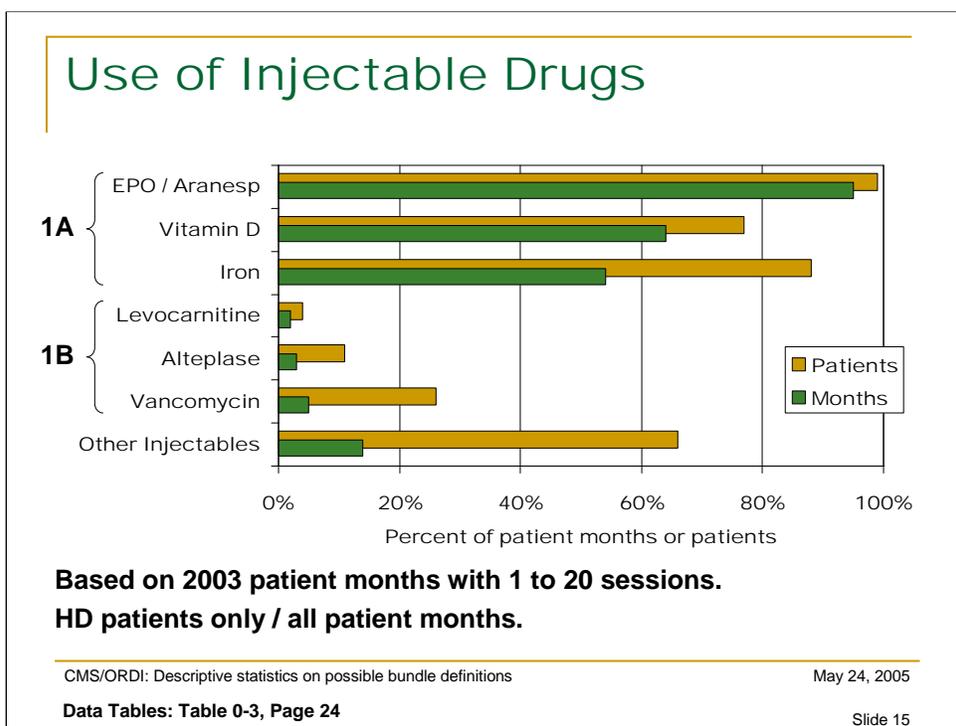
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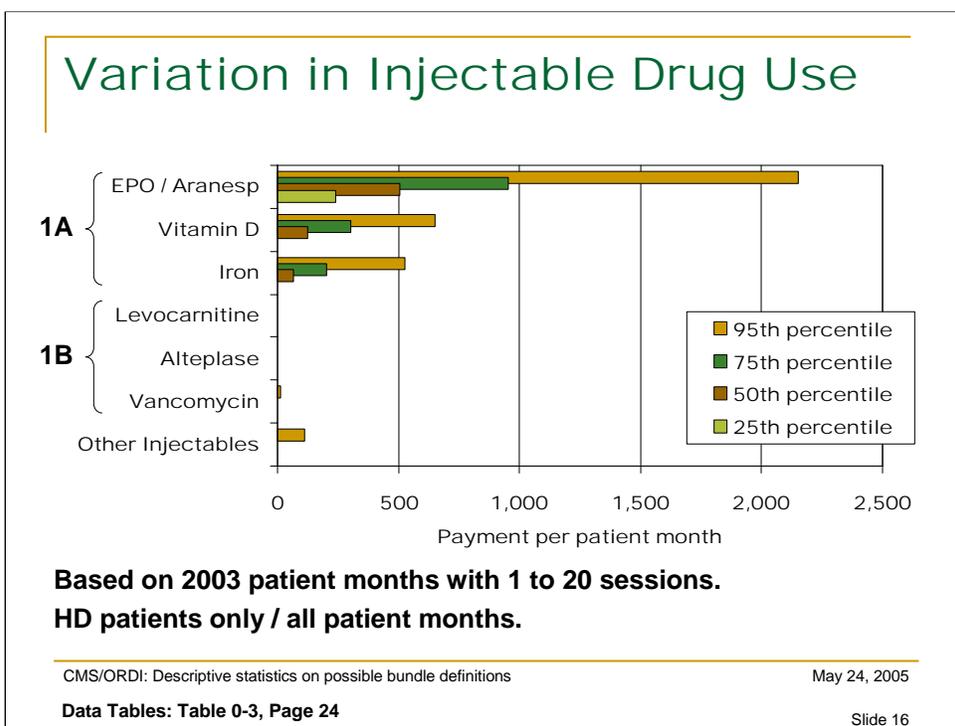
- **In the following discussion the term 'incremental payments' refers to services that would be included in the bundle under the most expansive 'facility services' option (1D) but that are not included in the composite rate. It therefore differs slightly from the definition of 'separately billable' services under the composite rate system.**
- Total incremental payments under bundle 1D are \$1,234 PPM.
- As shown in the previous figure and the above table, nearly all of the increase in payment from bundle 1A through bundle 1D is associated with EPO, iron and 'vitamin D'.
 - Payment for these drugs represents more than 87% of *incremental* payments, and more than 97% of all *drug* payments under the most expansive bundle (bundle 1D).
 - Laboratory tests that are thought to be 'related' to these three classes of drugs are equal to about 4 percent of composite rate payments and just over 5% of incremental payments.
- The incremental payments for levocarnitine, alteplase, and vancomycin (and related laboratory tests) represents just 2.3% (\$29) of incremental payments under the most expansive bundle.
- The incremental payments for the remaining injectable drugs and laboratory tests represents 3.5% (\$43) of incremental payments.
- The incremental payment for all other facility services represents less than 1.5% (\$17) of total incremental payments.
- **Note that these figures are based on patient months in 2003 for hemodialysis patients only who did not experience any 'events' to disrupt a 'full month' of dialysis. Components may not sum to the total due to rounding.**



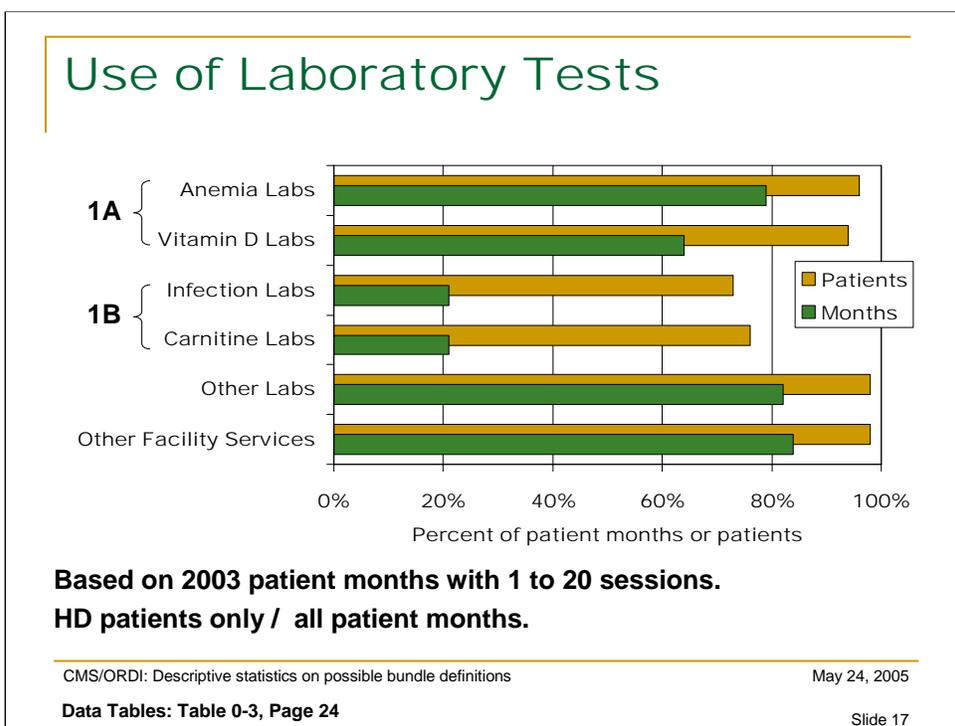
- Data on the variability of resource use reveals a complex pattern of resource utilization. It tells us something about the context within which a payment system will operate. It usefully emphasizes the nature of the problem that case mix and other payment adjustments need to address. However, the magnitude of the problem should not be overstated any more than it should be understated.
- In some months, patients use more of some services, less of others. An individual patient uses more services in some months and fewer in others. Much of these 'micro' level variations cancel one other out. It is the remaining systematic or persistent variation across patients that will be the principal focus of efforts to identify and develop necessary payment adjustments.
- As the scope of the services included in the bundle increases, the variability of the resulting total costs marginally increases.
 - Composite rate payments display little variability. The 75th percentile is only 16% higher than the 25th percentile.
 - Bundle 1A, in total (including CR services), shows more variation. The 75th percentile is 46% higher than the 25th percentile.
 - Because the drugs included in bundle 1A account for more than 90% of separately-billed services the remaining bundles show a similar pattern. Expanding the bundle beyond 1A does not appear to substantially increase overall variability.
- **Note that these figures are based on patient months in 2003 for hemodialysis patients only. They include all patient months with between 1 and 20 sessions, whether or not any 'events' occurred to disrupt a 'full month' of dialysis.**



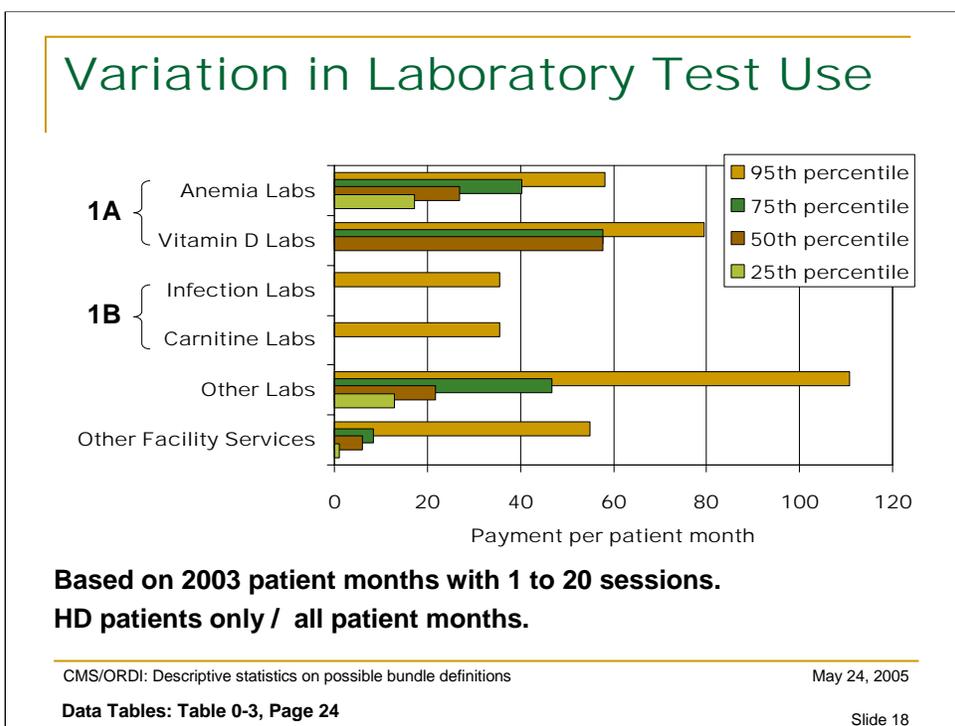
- All patients, by definition, use dialysis services. However, not all patient months involve claims for injectable drugs or laboratory tests. (It should be noted that slightly more than 2% of patient months in the database did not involve claims for any dialysis sessions. The reason for this is, at present, unknown. These 'no dialysis months' were excluded from the analysis.)
- Bundle 1A included the three major classes of drugs used by dialysis patients.
 - Claims for EPO are submitted for nearly all (98%) of hemodialysis patients, and EPO is billed in 95% of patient months.
 - 'Vitamin D' appears to be used less frequently than EPO, at least in a form that is covered by Medicare. Claims for 'vitamin D' are submitted for just over $\frac{3}{4}$ of hemodialysis *patients*, and 'vitamin D' is billed in 64% of *patient months*.
 - Claims for iron are submitted for nearly 90% of patients, but iron is billed in just over half (54%) of patient months.
- Use of the drugs included in bundle 1B is much more irregular than use of drugs in bundle 1A. Claims for levocarnitine, alteplase, and vancomycin are submitted for a minority of patients, just 4%, 11%, and 25%, respectively. These drugs are billed in less than 6% of patient months.
- Claims for other injectable drugs are submitted for two-thirds of patients, but are billed in just 14% of patient months. Use therefore appears to be much more irregular than use of EPO, 'vitamin D' and iron, though more common than the drugs included in bundle 1B.
- **Note that these figures are based on patient months in 2003 for hemodialysis patients only. They include all patient months with between 1 and 20 sessions, whether or not any 'events' occurred to disrupt a 'full month' of dialysis.**



- Use of drugs varies widely, of course, among patients or patient months.
 - 25% of patients months involve claims for \$240 or less of EPO, but at the other end of the distribution, 25% of patient months involves claims for more than \$950. 5% of months involved claims for more than \$2,100 of EPO.
 - The pattern of variation for 'Vitamin D' and iron is broadly similar to that for EPO although the dollar amounts are considerably lower. However, less than half of patient months involve any claims for iron or 'vitamin D', and compared to EPO the use of both is more highly concentrated.
 - The three drugs included in bundle 1B display even greater concentration. Less than 25% of patient months involve claims for vancomycin. Less than 5% of patient months involve any claims for levocarnitine and alteplase. This means that in those months in which one of these drugs is used, the additional cost is substantial. For example, average levocarnitine payments are \$8.50 over all months, but it is used in less than 2% of months. In those months in which it is used, the incremental payment exceeds \$500.
- The questions that these variations pose concern: (1) the amount of the variation that is justified; and (2) the extent to which these differences are systematic and predictable by a facility or by a case mix measure.
- **Note that these figures are based on patient months in 2003 for hemodialysis patients only. They include all patient months with between 1 and 20 sessions, whether or not any 'events' occurred to disrupt a 'full month' of dialysis.**



- Laboratory tests that are not included in the composite rate are billed separately for nearly all patients and are submitted on claims for the vast majority of patient months.
- Claims for the laboratory tests included in bundle 1A, for anemia and management of 'vitamin D', are submitted for more than 95% of patients. Anemia labs are billed in nearly 80 percent of patient months, while 'vitamin D' labs are billed in almost two-thirds of months.
- Claims for the bundle 1B laboratory tests are less common and more irregular, as may be expected. Claims for both 'infection' labs and 'carnitine labs' are submitted for about ¾ of dialysis patients, but occur in just over 20% of patient months.
- As would be expected from the large number and broad purposes of the tests included in bundle 1C, nearly all patients (98%) have claims for these tests, and tests are billed in more than four out of five (80%) of patient months.
- The figure also shows data on use of other facility services and MCP. Claims for these services are submitted for 95% of patients. Just over 80% of patient months involve claims for other facility services—which also means that nearly one out of five patients months does not. MCP payments are made in 95% of patients months. The reasons that MCP payments were not made in one out of 20 patients months has not yet been explored.
- **Note that these figures are based on patient months in 2003 for hemodialysis patients only. They include all patient months with between 1 and 20 sessions, whether or not any 'events' occurred to disrupt a 'full month' of dialysis.**



- **Note: The data on laboratory tests reflect only the tests for which separate claims were submitted. These data do not reflect laboratory tests that are paid for as part of the composite rate.**
- Use of laboratory tests also varies widely across patient months.
 - Claims for anemia tests are submitted in more than ¾ of patient months, and 'vitamin D' tests in more than 60% of patient months. On average, claims for these tests total \$28 and \$35, respectively. However, in 25% of patient months claims for anemia tests exceed \$40 and in 5% of patient months they exceed \$58. In 25% of months, 'vitamin D' labs exceed \$57, while in 5% of months they exceed \$79.
 - Claims for 'infection' and 'carnitine' tests occur much less frequently, possibly suggesting an episodic pattern of utilization. On average, claims for both are less than \$7 per month. However, in 5% of months claims for both classes of tests exceed \$35. This pattern suggests the occasional ordering of a more-or-less standard battery of tests in response to relatively uncommon, if not unexpected, events.
 - The 'other' laboratory tests display considerable variation. The average month involves claims for \$36. However 25% of months involve claims of less than \$13, while at the other end of the distribution 25% of months involve claims of more than \$46. 5% of months involve claims for more than \$110.
 - 'Other' facility and MCP payments are shown for reference. There is a marked difference between the 75th and 95th percentiles for 'other' facility services.
- **Note that these figures are based on patient months in 2003 for hemodialysis patients only. They include all patient months with between 1 and 20 sessions, whether or not any 'events' occurred to disrupt a 'full month' of dialysis.**

What do we know now?

Scope of the bundle and variation

- EPO/Iron/Vitamin D dominate the bundle
- Expansion of bundle adds little to variability
 - EPO/Iron/Vitamin D are used 'routinely'
 - Other drugs are used 'episodically'
- Laboratory tests follow a similar pattern
 - Some are used 'routinely'
 - Others follow a pattern of 'episodic' use
 - Limited contribution to total payments & variance

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- It is challenging to summarize the salient points that can be gleaned from the mass of descriptive data on the components of possible bundles, but a number of 'findings' can be distilled.
- First, EPO will dominate any expanded bundle. EPO by itself accounts for 60% of the 'incremental' payments in the broadest bundle. EPO, iron and vitamin D represent 87%, and the related lab tests represent 5%, of the increment costs.
- Second, the expansion of the bundle beyond EPO, iron and vitamin D does not substantially increase the variability of payments across patients—largely because of the *relatively* small dollar amounts involved. Nevertheless, the services in bundle 1A display a distinctly different pattern of use than the services in bundles 1B and 1C.
 - EPO, iron, and vitamin D are used 'routinely' by the majority of patients. Use of these drugs is consistent with treatment of chronic illness.
 - The drugs included in bundle 1B and 1C are used by a small percentage of patients and are used in an even smaller percentage of months. Use of these drugs is typical of the treatment of acute or episodic illness. The average use of these drugs is low because most patients do not use them. However, when they are used they add substantially to the cost of treatment in a given month.
- Laboratory tests generally follow the same pattern as drugs. Some are used 'routinely'. Others follow a pattern of more episodic use. The contribution of laboratory tests to overall variation in resource use is, however, small.

What do we know now? Amount and nature of variation

- Variation among patients
 - Questions raised by variation in EPO use
 - Questions raised by variation in other drug use
- Variation among facilities
 - Patient variation may average out at facility level
 - Systematic variation across types of facilities
 - Impact on facilities of difference sizes
- The risk of patient selection

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- Use of drugs and laboratory tests varies widely across patient months, even for those drugs that are used 'routinely'.
 - The variation in the use of EPO, iron and vitamin D raises several questions: To what extent is variation of this magnitude clinically justified? Does this variation reflect differences in patient needs or does it reflect differences in practice patterns?
 - The variation in the use of other drugs raises these same questions, plus several slightly different questions: To what extent can or should a payment system reflect episodic events (e.g., infection) that require substantial resources to treat? What are the implications for patients and providers if the payment system does not match payment to higher resource needs during acute episodes? Are these episodes simple unpredictable, random events?
- Much of the variation among patients will, of course, be muted at the facility level. These differences tend to average out across a facility's patients. The descriptive data suggest that such 'averaging' will substantially mute—but not eliminate—differences among types of facilities.
 - Nevertheless, it will be necessary to closely examine the extent to which individual facilities have higher or lower costs due to systematic differences in the composition of their patients. In particular, it will be necessary to examine whether these systematic differences may be reduced by case mix adjustment.
 - The magnitude of 'averaging' effects will vary among facilities and is strongly related to facility size. Specific attention will need to be given to the extent to which the risk created by variation at the patient level can be mitigated for smaller facilities.
 - Finally, even if patient-level variation has little effect on facility level averages, the existence of large unexplained variation that may be attributed to patient needs (not practice patterns) suggests that patient selection may become a significant issue.

What do we know now?

Unit of payment

- Composite Rate
 - Sessions effectively determine monthly payment
 - Per session payment adjusts for 'events'
- Separately billed items & services
 - Monthly payment more weakly related to sessions
 - Different events have different effects
- Implications
 - No obvious solution
 - Per session payment requires 'event' adjustment
 - Per month payment requires 'event' adjustment

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- Finally, the descriptive data have several implications for the question of what an appropriate unit of payment would be for a bundled payment system.
- Under the composite rate system, the adoption of the session as the unit of payment has considerable appeal. The number of sessions provided during a month exert a strong influence on costs. A session-based payment system automatically adjusts for 'events' such as the initiation or termination of dialysis or a hospital stay that cause a patient to receive less than a full month of dialysis from a facility.
- The use of separately billed services is much more weakly related to the number of sessions of dialysis that a patient receives. There is some relationship between frequency of dialysis during the month and use of separately-billed services. However, different 'events' have different effects on use of separately-billed services.
- Unfortunately there is no simple or obvious solution to the problem. A session-based payment system would require adjustments for events that have little impact on the monthly use of separately-billed services. But so, too, would a month-based payment system for events that *do* affect monthly use of separately billed services.

Policy Criteria/Considerations

- **Safe:** care does not injure patients
- **Effective:** only beneficial care is provided
- **Patient-centered:** patient values guide care
- **Timely:** care provided when it is needed
- **Efficient:** avoidance of waste
 - Delivery of care
 - Administrative
- **Equitable:** patient needs determine care

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- The descriptive data suggests several answers to the major policy-related questions related to the goals or purposes of bundled payment.
- **Safety:** A broader bundle could reduce risks for patients, e.g., conservation and management of venous access.
- **Effective:** A broader bundle could create an opportunity to reduce unnecessary use of drugs and duplication of laboratory testing. However, the wide variation in costs suggest it could also make needed care more difficult to provide.
- **Patient-centered:** There is no obvious impact of a broader bundle on the extent to which treatment would reflect patient preferences.
- **Timely:** A broader bundle could improve timeliness of care by rewarding early response to complications or co-morbidity. Whether it will have this effect will depend on how providers respond to the risks associated with the broader bundle.
- **Efficient:** Generally, a broader bundle could increase efficiency by simplifying billing rules. The consolidation of laboratory billing could, however, create a significant new administrative burden for dialysis facilities.
- **Equitable:** The most significant issue highlighted by the descriptive data is whether a case mix adjustment that does a 'good enough' job of matching payment to resource needs can be devised.